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ELECTRIC RAILWAY JOURNAL

Consolidation of Street Railway Journal and Electric Railway Review
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What Kind of Automatic Substation Overload Protection?

WHEN the question of putting in automatic control comes up for discussion between the manager and the electrical engineer, the former is likely to put his foot down pretty hard on some particular feature which he thinks should govern. For example, he may say that service must be uninterrupted regardless of everything else and the substation must look out for itself. Or he may be more solicitous for the machinery, saying that a slight interruption to service cuts no figure, but valuable substation apparatus must not be jeopardized. There is still another aspect which may interest him, namely, the way in which the station will behave with respect to distribution of load and to voltage fluctuation. The substation must not, through the opening and closing of its mysterious relays, unduly interfere with the line voltage by shifting loads promiscuously. Of course, there is also, and usually, the matter of cost to be considered in connection with each plan.

Given the requirements, it is up to the electrical engineer to analyze his own problem with consummate skill. For this purpose he has not heretofore had much more than descriptive literature available. But thanks to the symposium on the use of resistance as a factor in insuring good service from automatically-controlled substations, printed in the June 24 issue of this paper, and the contributions to the discussion in the issues of Aug. 5 and Aug. 12, his need for specific technical information has at least in part been met.

This paper has no hard-and-fast rules to suggest as guides in automatic substation design. The subject is too varied for that. All that can be hoped in this direction is that such information as is given in these contributions on the subject will be carefully assimilated and applied.

The Coal Industry "Should Worry" About the Public

ON LAST April 1 there was surplus coal and the price, therefore, threatened to go down to the point that the existing rate of wages could not be paid. The miners would not accept less. The strike, prolonged through four and one-half months, created such a shortage and consequent demand that high coal prices are assured throughout the winter. So the operators quickly agree to the old wage scale, the check-off system, no arbitration, etc., and sign a contract extending to next April 1. The deadlock is broken, but the public and all industry must pay the bills.

A pretty cycle. It solves the problem for the operators. The miners preserve their high wage scale. But where do the public and business get off? What slightest assurance is there that the same cycle will not be repeated next year? The committee that is to be created will have no authority. It can only recommend and the outcome of its work is not promising. The immediate interests of the miners and operators are served by the settlement, and there is not likely to be a coal famine this winter. Beyond this, no accomplishment is in evidence. The operators can certainly take no pride in being party to such an unconstructive settlement. For the problem is before the country just as seriously as before and the permanent solution is only postponed.

The Public Must Protect Itself

CONGRESS will be derelict in its duty if, during the coming session, it does not in some way limit the present power of railroad employees to stop interstate transportation by striking. Congress has plenty of power as well as precedent for action of this kind. The Erdman act and the Newlands act differentiated labor engaged in transportation from that in other undertakings, and the vital concern of the public in the settlement of railroad problems is again emphasized in the present railroad act. The purpose of this act was to secure the development and continuity of service of the interstate railroads of the country, and if the law did not go far enough, its scope should be increased. In the present state of the public mind the railroad and coal situation stand paramount and far exceeding in importance as issues the tariff or the bonus to which Congress has given a great deal of time during the past eight months.

The most serious aspect of the present trouble was the abandonment of work by train operators on several roads because of the presence of guards or because of alleged defective equipment. The first reason is a direct challenge to the power and duty of the constituted authorities to keep order. A concerted attempt to prevent either the states or the national government by intimidation from protecting private property and otherwise carrying out the law is a far greater assault against our present system of government than to abandon work because of dissatisfaction with wages and working conditions. If the railroad union heads are to have a veto on the movements of the police, the militia or other guards authorized by law, they might just as well take the title of commanders-in-chief, which by the constitution belongs to the President. As to the excuse of defective equipment, this will strike most observers as a subterfuge only, when unsupported by evidence.

Admittedly it will be difficult to draft an entirely satisfactory national law to cover the situation because of the great freedom with which men have been able to stop work. It has been said, also, that any such plan is equivalent to involuntary servitude and contrary to our ideals. Nevertheless, some way must be found to make the welfare of the whole people, which is paramount to the desires of any group or class, free from the caprice of that group. When a man accepts

a job with a public service industry, he must accept a restriction on the right to a collective strike. If he is unwilling to submit to this he should get a job in another industry in which the public welfare is not the controlling consideration. At the same time wages in these industries should always be adequate to attract good men.

There are precedents for limiting the freedom of action of labor engaged in certain industries on which the public is dependent. The Kansas Industrial Act is one precedent and the Industrial Disputes Act of Canada is another. The reason there are not more precedents is that up to recently there has been no great need for any. Now, however, it is within the power of a few people to stop a vital utility service such as railroad transportation and the mining of coal, and they have repeatedly shown a readiness to use this power to serve their own ends. The public must protect itself against repetitions of the present situation whether or not a truce to settle the existing strikes is arranged.

European Tramways Have Also Had Their Financial Troubles

REPORTS from abroad prove that the tramways in European countries have passed through a cycle not greatly different in kind from that here, but the changes in most cases have been even more marked because the depreciation in the purchasing power of currency has been greater. It is not surprising that this situation should be found because tramway conditions are largely the same everywhere, and there is melancholy satisfaction in realizing that American fare experiences have not been unique. Briefly the situation has been on both sides of the Atlantic that wages and the cost of materials rapidly increased, there was great difficulty in securing an increase in fare from the authorities, and when this increase came, traffic fell off, as a rule. In Great Britain the difficulties appear to have been somewhat less in degree than elsewhere in Europe, due perhaps to less depreciation of the currency, to greater ease in getting fares because most of the larger properties are municipally owned and to the great industrial activity of the larger towns during the war in the manufacture of munitions.

The interest of American managers in the situation centers particularly on the solutions adopted. That in Paris was described at length in the issue of Aug. 5. Briefly, the city purchased the property and leased its operation to a private company on a sort of service-at-cost plan, but as yet it has been impossible for the leasing company to operate the system at the fares charged without a good-sized deficit, and this deficit is being made up out of the municipal funds. Up to the financial crisis brought about by the World War, the Paris tramways were operated by seven private companies. In Berlin the city has taken over the tramway system and in this case is operating the cars directly, municipalization taking place in 1920. Here the effort required to raise the fare as rapidly as the mark depreciated naturally has been great, and tickets issued by the tramways department had to carry a statement that they would no longer be good for a ride when retired by public announcement. In the countries of even greater currency depreciation, as Austria, the rapidity and extent of fare increases have been even greater.

It is instructive to note that in spite of all these vicissitudes, in no country has the belief been held that because of these conditions electric railways are obsolete. As with every other going concern, there are expenses of operation and these have to be met by charges for the services rendered, supplemented in some cases by subsidy. But every one realizes that the electric cars have still to be kept running, even in the countries where the currency has fallen to almost minute values.

Electric Railways Can Use National Safety Council Service

THE coming eleventh annual safety congress promises to be unusually effective from the standpoint of the electric railways. The program contains the names of three of their presidents, Arthur W. Brady, Frank R. Coates and Britton I. Budd, and there are others well known in the general safety department of the electric railway field. The participation of these men in the congress insures its value to all who really desire to mitigate the accident menace.

The National Safety Council has not been taken as seriously among electric railways as in the manufacturing industries, yet if the organization is what it should be, it ought to command the support of one as much as the other. Surely the annual costs of accidents on most properties is sufficient to cause grave concern and every available means to reduce them should be utilized.

If the National Safety Council as at present conducted does not suit electric railway managers, they can improve it from the inside if the leaders among them will take hold. The council is a going concern; it is a truly national affair; it possesses possibilities of helpfulness if only through its function of acting as a clearing house for safety information.

What's the Matter with the Company Sections?

THE company sections of the American Electric Railway Association seem not to be as active as they formerly were. Have the sections lost their vitality, or have conditions in the industry so changed that they are no longer desirable or necessary? This is a pertinent question, because the electric railway industry has passed through a period of strenuous trial, and while it is now on the upgrade it needs to utilize every agency that can help to bring it back to its normal status. Is the company section one such agency, and if it is, why is not this agency being used more effectively?

There was a time during the war period when a slump in company section activities was to be expected. Such a slump occurred. But it is now nearly four years since the armistice was declared. This seems long enough to allow the sections to get back into form. Why have they not done so?

There is a real need for company sections of the American Association or their equivalent. There is an advantage in having the stimulus due to membership in a national organization. But there is no magic about a company section that will cause it to operate itself. Motive power is needed locally, and this means conviction on the part of a few energetic spirits that the proposition is worth while. Probably the present state of suspended animation is due to the fact that the hustlers in most of the sections are hustling in connection with some other activities, which for the time they consider more important.

Limiting Temperatures of Railway Motors

The Performance of Railway Motors as Limited by Temperature of the Windings—The Relation of Motor Load to Internal Temperatures and Methods of Measuring Temperatures Are Discussed

BY G. E. LUKE
Motor Engineering Department, Westinghouse Electric & Manufacturing Company

THE characteristics of an electric motor are such that it will try to carry any load which is put upon it, regardless of the magnitude of the load. Thus in the hands of unskilled operators it is easily possible to abuse a motor by requiring it to perform excessive overloads. This condition is especially possible in railway service, where all conditions of loads are found, such as operating with one-half of the motors cut out, pulling in disabled cars, bucking snow, operating with tight brakes and many other possibilities. The existence of overloads is indicated by repeated "blowing" of the circuit breaker, flashing of the motors and slipping of the wheels. A motor may be overloaded, however, without any of the above indications. The real criterion of overloading is the maximum internal motor temperature. The result of excessive temperatures is to deteriorate the insulation; failure is not instantaneous; on the contrary, the motor may not fail until weeks or months afterward.

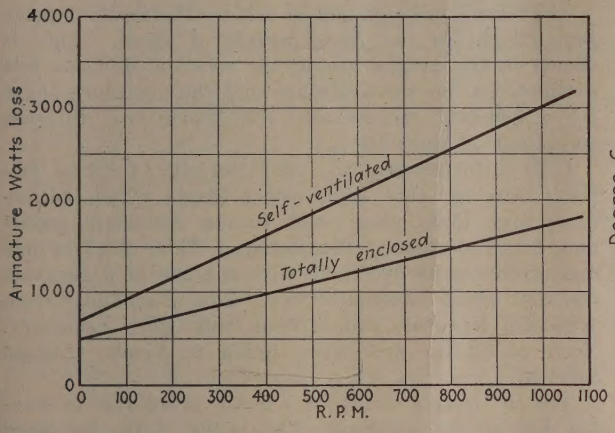
The purpose of this article is to discuss, briefly, insulation life as influenced by temperatures, the relation of motor load to the internal temperatures and the method of measuring these temperatures.

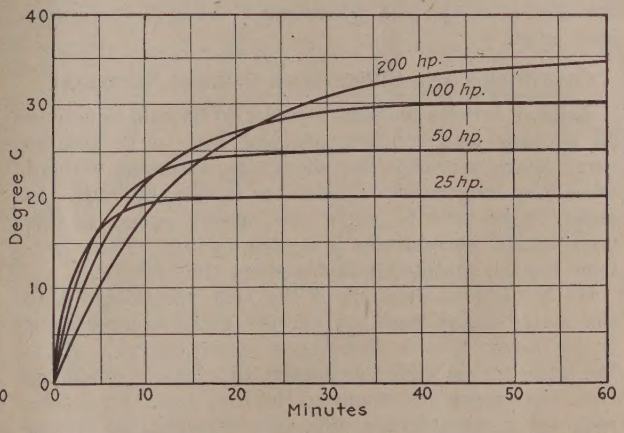
The insulation used on railway motor windings is composed of many materials. From the temperature standpoint they are divided into two classes, A and B. Class A insulation is composed of specially treated or impregnated cotton, linen, paper and similar materials. This type of insulation is generally found in the light traction railway motors in which wire wound armature coils are used. This insulation deteriorates in strength with age even at room temperatures; high temperatures act to accelerate the deterioration. A temperature of 105 deg. C. is given in the standardization rules of the A. I. E. E. as the maximum temperature which this class of insulation can stand continuously without endangering the life of the motor. In order to reduce weight to a minimum it is considered good engineering to run railway motors at higher temperatures than are found on stationary machines. Experience has shown that class A insulation exposed to actual temperatures ranging from 115 to 125 deg. C. will give a motor life satisfactory for railway service.

Proper impregnation of windings will greatly improve this insulation. The varnishes or gums tend to keep moisture out of the windings and to prevent oxidization or burning of the insulation under high temperatures.

Insulation life as affected by temperatures is also a function of time. Class A insulation for short periods may be exposed to temperatures much higher than the values previously given. For example, tests on a small railway motor at loads ranging from 150 to 300 per cent normal rating for time periods of five to thirty minutes gave maximum internal temperatures varying from 150 to 200 deg. C. On three of these runs the armature insulation varnish started to "smoke" (the actual temperatures recorded ranged from 175 to 200 deg. C.). After these special tests the coils were torn apart and the insulation was found to be in good condition. Neither the cotton tape nor the treated cloth showed signs of failure either mechanically or electrically. Such temperatures, however, if repeated would no doubt cause failure, especially after the varnishes and gums have been driven out of the windings.

Class B insulation is composed of mica, asbestos and other materials capable of resisting high temperatures in which class A material or binder is used for structural purposes only and may be destroyed without disqualifying the insulation for continuous service. This class of insulation is used on the majority of the heavy traction motors, especially those which have strap





AT LEFT—GRAPHS FOR A 65-HP. RAILWAY MOTOR SHOWING RELATION OF WATTS LOSS DISSIPATED FROM ARMATURE ON CONTINUOUS DUTY TO THE R.P.M. ON BASIS OF A 65-DEG. C. RISE BY THERMOMETER. AT RIGHT—APPROXIMATE "HOTTEST SPOT" CORRECTION FACTOR AT NOMINAL RATING FOR VARIOUS SIZES OF MOTORS

wound armature coils. This insulation will safely withstand temperatures of 150 deg. C. or more on continuous duty. In fact, with this type of insulation, the limitation to the maximum permissible temperature is quite often found not in the insulation but in the soldered connections. Ordinarily "half and half" solder melts at approximately 180 deg. C. By the use of a tin solder this melting point may be increased to 230 deg. C.

It is possible to have a coil insulated with both class A and class B insulation and still be equivalent to a class B insulated coil. This may be done, for example, in a strap wound field coil with asbestos insulation between the straps and several layers of mica or asbestos wrappers around the coil, these layers being held in place by a few layers of treated cloth and tape. In this coil the class B insulation is found where the maximum temperatures exist. The class A insulation, being on the outside of the coil, is exposed to temperatures considerably under the internal temperatures.

The temperatures previously referred to are the maximum internal temperatures or the so-called "hottest spot" and not the temperatures obtained with the usual thermometer method. On overloads the maximum temperatures are found on the copper and the insulation adjacent is exposed to this temperature. It is at this point where insulation failure first starts and not on the outside of the coil, where much lower temperatures may exist.

CONTINUOUS AND SHORT TIME RATINGS NECESSARY

Railway service requires a motor to be able to deliver an average load continuously and also to be able to carry heavy overloads for short time intervals without exceeding dangerous temperatures in the windings. In order to be able to apply the motors properly, this requirement necessitates a double rating. These ratings are the continuous and a short time rating.

On continuous duty all of the heat produced due to the motor losses must be carried away as fast as it is generated; that is, there is no stored energy. Starting with the imbedded armature, this loss is conducted from the copper principally to the iron core. To do this requires a temperature difference between the copper and the core, since the heat flow is across the insulation. Electrical insulation is also good heat insulation. For example, the average insulation has a resistance to the flow of heat of approximately 3,000 times that of copper; this means that if a loss of one watt is flowing through a piece of insulation 1 in. square and only $\frac{1}{16}$ in. thick the temperature drop will be about 20 deg. C. This drop is unaffected by ventilation and depends only upon the heat flow and the thickness of the insulation. This heat loss due to the copper loss is conducted to the iron core, where it then flows to the cooler portions of the iron, namely, the ventilating surfaces. The iron loss also takes this same path. The required temperature drop through the iron will be only a few degrees, due to its relatively good thermal conductivity. It requires a certain temperature drop at the ventilating surfaces in order to transmit the heat loss to the inside air. This temperature gradient between the surface and the average inside air temperature is a function of the relative velocities between the surface and the air and the watts per square inch of surface which must be dissipated.

With an inclosed motor, the average internal air temperature is high, since the armature loss which has been transferred to this air must now be transmitted to the frame, and this loss, together with the field loss, must all be dissipated from the external frame surfaces. Each portion of this heat path requires definite temperature drops. For winter operation in cold climates self-ventilated motors are usually provided with covers for totally inclosed operation. The fan on the armature under these conditions is effective in circulating the internal air and thus materially increases the rate of heat flow to and from the ventilating surfaces as well as equalizing the internal temperatures. The windage loss due to the fan in the average railway motor is small and does not exceed 5 per cent of the total losses at the average operating speed. This loss is more than compensated for by the fact that the increased windage inside of the motor, according to tests on a 50-hp. motor at the continuous rating, decreased the internal temperatures 13 per cent, which shows the importance of proper internal ventilation even on inclosed machines.

On the other hand, with a self-ventilated motor in which a definite quantity of air is pulled through the motor, the internal air temperatures are much lower and the surface velocities relative to the air are also higher. Both of these conditions give the ventilated motor a greater continuous rating than the inclosed motor of the same size.

The benefit to be gained by self-ventilation is roughly proportional to the fan's peripheral speed. This is shown in the graphs giving the relation of watts loss dissipated from the armature and the armature speed for a constant temperature rise under two different conditions of ventilation.

It is unfortunately the characteristic of series motors, however, that high motor losses which accompany high loads also result in low armature speeds and hence decreased ventilation. This disadvantage can of course be overcome with the use of a separate constant speed external blower. This is an added complication, however, and is done only when necessary. Such conditions are often found in heavy traction service.

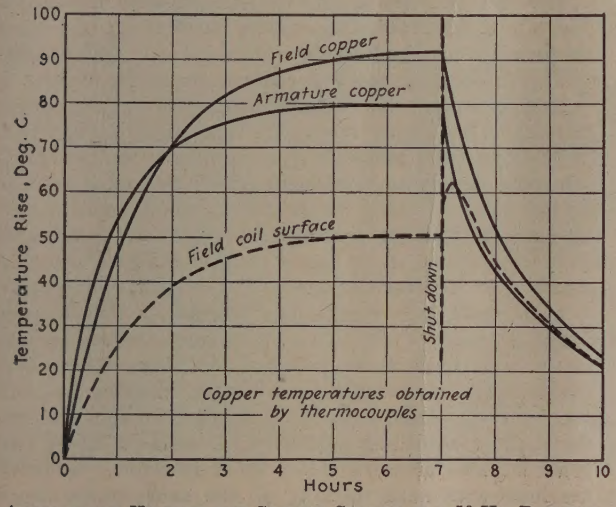
The continuous rating of a motor is greater in service than on the test floor. This is due to the increased ventilation on the external frame resulting from the car movement. This is especially pronounced with an inclosed motor, where all of the heat loss must be liberated from the frame. In such cases an average speed of 10 m.p.h. will result in temperatures 15 to 20 per cent lower than those found on the test floor. With self-ventilated motors the heat dissipated from the frame ranges from 25 to 65 per cent of the total loss, depending upon the motor speed at the continuous rating. Thus with this type of motor the temperatures will be reduced approximately 5 to 15 per cent with a car speed of 10 m.p.h. compared to the temperatures obtained on the test floor.

The load carried by a motor in service is anything but a continuous load. For this reason a short time rating is used, namely, the nominal or the one-hour rating. The purpose of this rating is to give an indication of the motor's short time or thermal capacity, since with such loads the heat losses cannot all be liberated as fast as generated; in other words, part of the losses must be stored up in the motor copper and iron. The storage of the heat is of course accompanied by an elevation of the motor temperature.

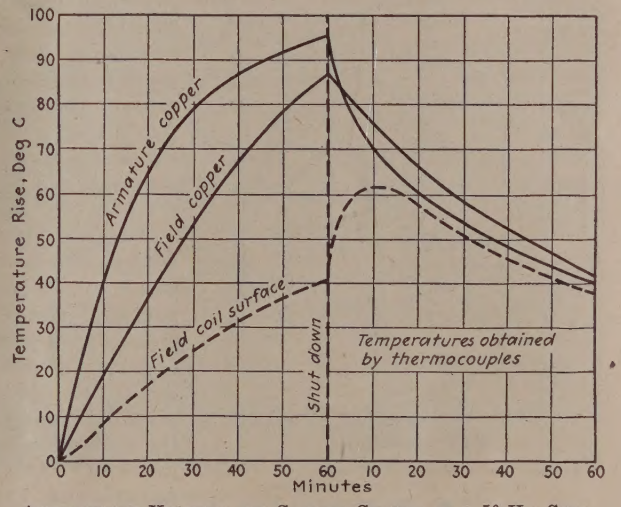
At the nominal rating the losses of the motor which take the form of heat are partly liberated from the

frame by radiation and convection (principally the latter), a part is carried away by air currents passing through the motor, and the remainder must be absorbed by the motor parts. On a slow speed motor where the ventilation is relatively small as much as 85 per cent of the losses may be absorbed, the remaining 15 per cent being accounted for by heat loss from the frame and air through the motor. On the other hand, with a well-ventilated high-speed motor it is possible to find 10 per cent of the loss dissipated from the frame, 30 per cent carried away by the ventilating air, with the remaining 60 per cent absorbed. This shows that the one-hour rating is not a true indication of the motor's heat storage capacity, since the percentage of heat loss stored in the motor during this run is a function of the motor's ventilation.

The real limitation to the short-time rating is due to the fact that the heat losses are not uniformly distributed throughout the motor but are concentrated in the copper windings, which have relatively little weight



APPROXIMATE HEATING AND COOLING GRAPHS OF A 50-HP. RAILWAY MOTOR SELF-VENTILATED AT CONTINUOUS RATING



APPROXIMATE HEATING AND COOLING GRAPHS OF A 50-HP. SELF-VENTILATED RAILWAY MOTOR AT THE ONE-HOUR RATING

and are well heat insulated from the heavier iron masses. This is especially true of the armature windings, since the current density in these are generally greater than in the field windings. A loss of 5 watts per pound of copper will raise its temperature 100 deg. C. in one hour if all is absorbed. However, at the nominal rating the armature loss ranges from 15 to 50 watts per pound of armature copper, the latter figure being found in the smaller motors. Thus, the percentage of armature copper loss at the nominal rating, which must be transferred through the insulation to the iron or air, ranges from 66 to 90 per cent. This requires the internal copper temperature to be greater than the iron core temperature, and if it is desired to estimate these internal temperatures from the iron temperature by thermometer the conventional "hottest spot" correction factor must be added. This factor is a function of the heat density flowing through the insulation, the thickness of insulation and condition of load, whether continuous or short time. The approximate value of this correction or internal temperature drop is shown in the accompanying graphs, for various sizes of motors at the nominal rating. At other loads this factor will vary approximately as the square of the current. This shows clearly the small thermal capacity of the armature copper on the smaller motors.

For overloads equal to twice the one-hour rating the maximum rate of rise of the armature copper above the iron will be 9.6 deg. C. per minute for the 200-hp. motor and 28.0 deg. C. per minute for the 25-hp. motor.

On the test floor it is now possible to obtain the temperatures of any part of the motor with the use of temperature detectors such as thermocouples. The standard thermocouple for this work is the copper-advance couple. A welded or soldered junction of these two metals produces a voltage nearly proportional to the temperature of the junction. This voltage should be read with a potentiometer, which, for convenience, may be calibrated in degrees centigrade instead of millivolts.

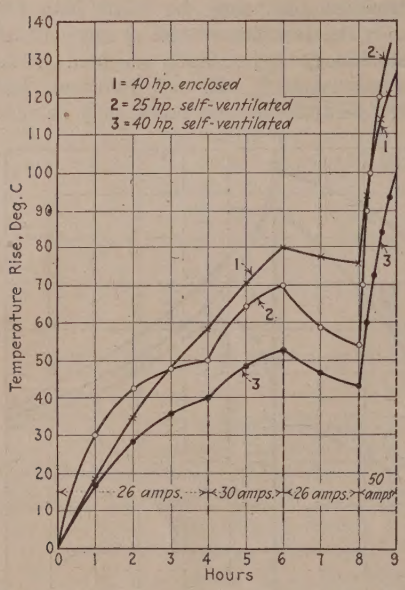
These same thermocouples may be built into the motor windings with the junction placed at any desired point. On the stationary parts, such as field windings, the voltage produced by the hot junction, and consequently the temperature at that point, may be read while running. On the armature, however, it requires slip rings and brushes in order to be able to read the temperature of the thermocouple junction while running. On account of the difficulties involved, this is not usually done, but the thermocouples in the rotating part are read after shutdown. This can be accomplished, for example, by allowing the ends of the thermocouple leads to extend a short distance beyond the band wire for quick connection after shutdown. In this manner accurate data may be obtained as to the maximum internal motor temperatures and the heating and cooling characteristics of the motor under any load conditions. The average temperature of the windings may also be obtained on the test floor by the resistance method. These resistances in a series motor are low and can be read accurately with the use of a Kelvin double-bridge. These data are of great value to the application and designing engineers.

In service accurate motor temperatures are much more difficult to obtain. The easiest method and the one usually used is the thermometer method. This of course does not give the maximum internal temperatures nor is it usually possible to take a reading when the motor is the hottest.

The resistance method has been used in several cases. This can be applied to the field windings. With the

current and voltage drop accurately known the resistance and consequently the average temperature of the windings may be determined. This method requires accurate and practically instantaneous reading of the voltmeter and ammeter for consistent results. A more satisfactory method is obtained by the use of thermocouples. With these the motor temperatures of the stationary parts may be obtained with the car in motion and in this way the maximum temperature may be found. (See article on "Determination of Train Make Up" by G. C. Bishop in ELECTRIC RAILWAY JOURNAL for Jan. 21, 1922.)

The heating curve of a 50-hp. self-ventilated railway motor at the continuous rating is given in an accompanying illustration. The solid lines are the maximum copper temperature rise of the field and armature windings as obtained with thermocouples. The rise by resistance was lower than these values. The dotted curves give the surface temperature rise of the field coils as obtained by either thermocouple or thermometer placed on outside of the coil. It should be noted that after shutdown the surface temperatures, as measured by thermometers, rise to a maximum value and then begin to fall. This rise is due to the decreased ventilation after shutdown. The difference between the field copper and the field coil surface rise is the temperature drop through the insulation. After shutdown the copper temperatures drop rapidly. The armature copper temperature falls quicker than the field. Conversely, the heating curve shows a steeper armature copper rise than that found on the field copper.



APPROXIMATE HEATING GRAPHS OF THREE RAILWAY MOTORS—MAXIMUM COPPER TEMPERATURE

This rapid change in temperature brings out clearly the difficulty encountered in obtaining the motor temperatures, especially in service where considerable time may be lost before temperature readings are obtained. At the one-hour rating the heating curves show the relative heating of the armature and field copper on short-time loads and why the armature is apt to be "roasted" if the motor is subjected to short-time overloads greater than the nominal rating.

The older types of railway motors were usually of the slow speed, non-ventilated type. These motors had large short-time capacity and relatively small continuous capacity. The modern demand for lighter and cheaper motors resulted in the development of the present line of self-ventilated motors. Since the ventilation is proportional to the armature speed greater gains in the continuous ratings could be made by going to these higher speeds. However, all railway service is subject to overload conditions which require heavy short-time capacity, and this can be obtained only by sufficient iron and copper masses for absorbing the surplus losses. This limitation restricts the degree of ventilation economically possible for this service. In order to bring out this point more clearly, the heating curves of three motors running over the same cycle are given. The ratings and weights of the three motors are:

Number	1-Hour Hp.	Rating, R.p.m.	Cont. Rating, Amp.	Weight, Lb.	Ventilation
1	40	700	26.0	1,900	Inclosed
2	25	1,200	32.0	1,000	Self-ventilated
3	40	700	38.0	1,900	Self-ventilated

The cycle consisted of the following:

(*a*) 4 hour run at a r.m.s. current of 26 amp.
(*b*) 2 hour run at a r.m.s. current of 30 amp.
(*c*) 2 hour run at a r.m.s. current of 26 amp.
(*d*) An overload run r.m.s. current of 50 amp.

The last portion of the cycle represents conditions which may be obtained by cutting out half of the motors on the car or in pulling in a disabled car, which practically doubles the motor's root-mean-square current.

In comparing the inclosed motor with the lighter self-ventilated motor it is seen that the heating curve of the ventilated motor is steeper. However, the limiting temperature on continuous duty will be much lower on the self-ventilated motor due to the internal ventilation. At the beginning of the last cycle the light ventilated motor is 22 deg. C. cooler than the inclosed motor. On the overload, however, since the temperature rise is practically determined by the watts loss per pound of copper and iron, the ventilated motor will necessarily have a steeper rate of rise. Thus, this overload can be carried for eighteen minutes by both the light ventilated motor and the heavier inclosed motor without exceeding a 100 deg. C. rise. If these two types of motors were called upon to deliver a heavy overload with both initially at the same temperature then the heavy inclosed motor would have a considerable margin over the lighter motor and would necessarily be able to carry the load longer. On the other hand, a self-ventilated motor of the same weight and characteristics as the inclosed motor will give a considerably lower temperature at the beginning of the overload and it will be able to run one hour at the 50-amp. load without exceeding the 100 deg. C. rise. In the example just cited the 1,000-lb. self-ventilated motor will do the same work as the 1,900-lb. inclosed motor providing the overloads are kept within reasonable values. Hence, in general, the saving in weight to be gained by using high-speed ventilated motors is determined by the heavy peak overloads and especially by those due to abuse or emergency conditions.

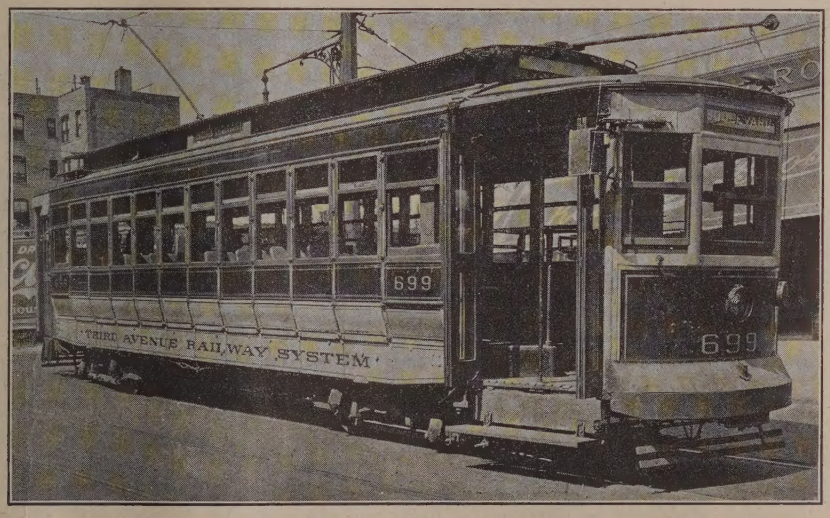
Airtight Door Developed

A NEW cast-iron door, 18 in. x 16 in. in size, has recently been developed by the Conveyors Corporation of America, Chicago, Ill. It is designed especially for boiler settings and is airtight. Floating hinges pivoted to door at the center insure an even pressure over the door when it is closed and locked. The door can be provided with either of two types of locks—with a wing nut at the end of a hinge bar or with a lever locking device, which is recommended when the door is subjected to frequent opening and closing.

Double-End Turnstile Car Tried in New York

Third Avenue Railway Has Remodeled One of Its Semi-Convertible Pay-as-You-Enter Cars and Installed Turnstiles and Other Automatic Equipment to Permit of One-Man Operation

THE Third Avenue Railway, New York, N. Y., has had one of its semi-convertible pay-as-you-enter cars equipped with turnstiles for double-end operation in trial service for the past two months. Many new features have been introduced in connection with the control, air brake and fare-handling equipment. The installation of the new equipment and the rearrangement of the apparatus on the platform and at the ends of the car were done in the shops of the company, under the supervision of J. S. McWhirter, superintendent of equipment, and many of the ideas and new equipment installed have never before been tried in electric railway service.



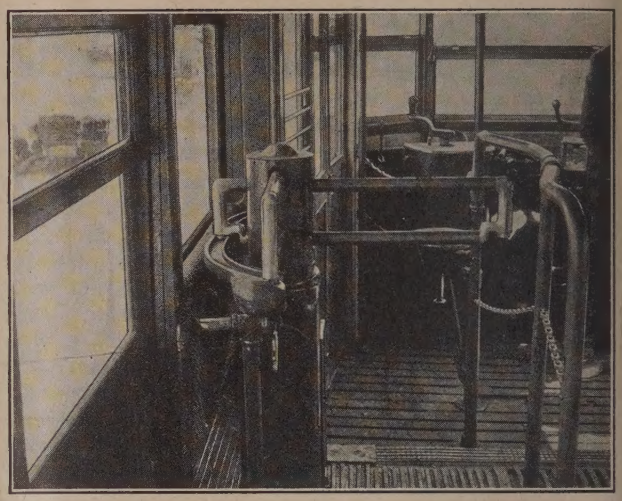
CAR AS RECONSTRUCTED FOR ONE-MAN OPERATION

At left—Folding mirror gives operator view of rear entrance. At right—Spacious front exit opening.

Car No. 699 is the particular one equipped and this is one of a lot of cars purchased from the J. G. Brill Company in 1909 and described in the *Electric Railway Journal* for Jan 23, 1909. The car is 30 ft. long over the corner posts and 43 ft. long over bumpers. As originally operated, there were seats for forty-four passengers inside the car body. In order to provide space for the installation of the turnstiles one cross-seat and two longitudinal seats were removed at each end of the car. Accompanying illustrations show the floor plans of the car before and after its rearrangement for one-man operation. As the car is arranged for double-end operation, four turnstiles are used, only two of which are necessary for operation in one direction. The car is operated on the pay-as-you-leave principle, the exit for all passengers being at the front end and entrance at the rear. The turnstile at the rear entrance acts only as a barrier to prevent people leaving by the rear door. The exit turnstile at the front end is released by the insertion of a 5-cent piece in a special type of fare box. The passenger can then pass out and the fare is automatically registered by the turnstile. Should a passenger wish change an additional exit opening is provided through the center so that he can receive his change from the operator and then deposit 5 cents in a Johnson fare box at the right of the operator, as the passenger leaves.

The turnstiles used are of the H. R. Langslow reciprocating arm type, handled by the Damon-Chapman Company, Rochester, N. Y. This type of turnstile is used in the stations of the New York, Westchester & Boston Railway and was described in the *Electric Railway Journal* for Oct. 1, 1910, and June 8, 1912. A particular advantage comes from the use of this type of turnstile in that the arms are made to slide through the center portion of the turnstile through the guidance of a cam. Much space is thus saved, as the turnstile can be set directly against the side of the car instead of occupying additional space for the rotation of the turnstile of ordinary types. Pipe railings are provided for guiding the passengers into and out of the cars. The tops of these railings extend slightly above the arms of the turnstile, and the bottom portion is closed in by the use of chains as required. The two turnstiles which are not in use with the car operating in one direction are also closed by the use of chains. The type of fare box used to unlock the turnstiles is of a type similar to that in use in the Interborough subways in New York in connection with their station turnstiles.

As the operation of the rear entrance door is controlled from the front end of the car, mirrors are installed at the right entrance to the operator. Clearance limitations are such that the mirrors must be folded in against the car while the car is in motion. The operation of these mirrors is interlocked with the door operation, so that the mirror swings out into position as either door is opened and folds in again after the last door closes. Mirrors are also installed inside the car above and to the right of the operator, so as



TURNSTILE AND RAILING ARRANGEMENT AT END OF CAR. PASSENGERS LEAVE BY THE RIGHT AND CENTER OPENINGS. LEFT HAND OPENING IS USED FOR REAR ENTRANCE

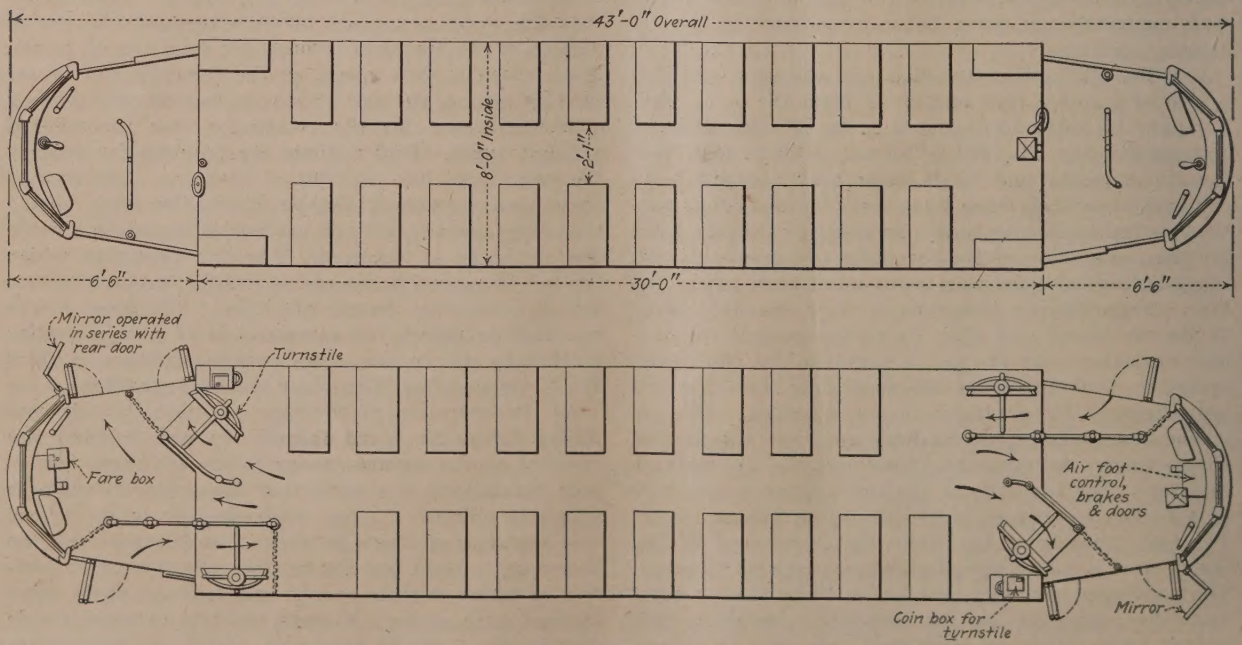
to give the operator a view of the inside of the car and enable him to see passengers as they leave their seats for exit.

The doors are operated by National Pneumatic door engines, electrically controlled, and are opened by means of a push button placed at the operator's left hand, while a selective switch is provided which permits him to leave either front or rear door closed as desired. Both doors are closed by means of contacts on the foot pedal, but the contacts for the front door may be closed before the operator wishes to close the rear door by the use of a small hand lever connected to the foot switch contacts. The front door is usually closed first to give the operator an unobstructed view in the mirror of the rear door.

The control is of a new design of automatic acceleration K controller. On the top of a standard K controller on each platform is mounted a balanced air cylinder with rack and pinion attached to the main drum shaft. The main controller handle is of the pivoted type, normally held at an angle of about 30 deg. from the vertical by a spring. The reverse drum is thrown manually.

When the small hand lever connected to the foot switch is thrown to the position which closes the front door it also energizes a circuit through magnets whose valves operate the controller air cylinder to place the main drum controller on the first point. The movement of the main drum to this position provides a pick-up circuit for the line switch through the door interlocks and the foot switch contacts. Therefore, after the foot switch is moved to the release position to complete the rear door closing circuit, and the last door closes, the line switch comes in and starts the car. The coming in of the line switch in turn operates the main drum magnet valves to advance the main drum under the control of a series limit switch to the full parallel position, thus giving automatic acceleration without any movements on the operator's part other than those necessary to close the doors and put the foot pedal in the full release position.

When the line switch is dropped out by returning the



FLOOR PLANS OF CAR. AT TOP, CAR BEFORE RECONSTRUCTION. AT BOTTOM, REMODELED CAR

foot pedal to the running, lap, service or emergency positions the main controller drum is automatically returned to the off position.

Should the operator wish to operate the controller in reverse, or to any position other than full parallel, he has only to bear down on the pivoted controller handle (this movement draining air from the operating cylinder) and to operate the controller as a standard drum controller. This feature is particularly valuable in cases of controller failure and when dynamic braking is desired, the latter being thus independent of line current.

The air foot control mechanism is a modification of the McWhirter foot-operated control which has been in service on cars of the Third Avenue Railway System for several years. In addition to its use to close the doors and operate the automatic control as already described it operates a piston type straight air brake valve and an air-controlled emergency valve. The pneumatic combination provides for a delayed balancing of the door engines on all four doors after an emergency application from the foot pedal, instantaneous balancing of the door engines after an emergency application from the hand-operated "Conductor's" valve, a quick recharge of the emergency valve, and full pressure in the door pipe before the brakes release. Provision is made to apply and hold the brakes in emergency in the event of a broken pipe or reservoir cock or low air pressure. The control is interlocked to prevent trolley current being applied to the motors until the brake cylinder pressure has fallen to 35 lb., but this feature does not apply to dynamic braking.

It is to be noted from the above that aside from pushing a button to open the doors and throwing a small lever to close the front door all operations of motors, brakes and doors are controlled through the operator's foot pedal.

While this car has been operating in service for several months with a comparatively small number of defects, and while the operation has nearly reached the point where the car can make as good schedule as the same size of car operated with two men, the Third Avenue Railway still regards the car as experimental, and further changes may be made before a decision is reached as to its adoption.

Some Details of the French Midi Electrification

IMMEDIATELY after the cessation of hostilities in the late war the French government sent a technical commission to Switzerland, Italy and America to study existing railway systems. This commission recommended that 1,500-volt direct current be adopted as the standard for the electrification of all French railroads. Conforming with this decision the Midi Railway is using 1,500-volt direct current for all new installations and the sections already electrified at 12,000 volts will be changed to the lower voltage to secure uniformity.

The lines of the Midi Railway are mostly located in the south of France, north of the Pyrenees. As far back as 1906 the management commenced an exhaustive study of the electrification of this part of the system, having in mind the utilization of the water power available on the northern slope of the Pyrenees. By 1914 four sections had been electrified with single-phase current at 12,000 volts and 16.67 cycles. The war stopped all work.

Conforming with the new system power will be generated in six stations, or groups of stations, capable of developing a total of 362,000 hp. The stations will be put up progressively as the different sections are electrified. The head of water varies from 350 ft. in the station with the lowest head to a maximum of 2,500 ft. Power will be generated at 8,000 volts and 50 cycles and will be distributed to the railway substations over a 60,000-volt three-phase distribution system. Different points of the distribution system will be connected by a 150,000-volt transmission line.

The railway substations, which are located along the railroad at intervals of 12 to 18 miles, are connected directly to the 60,000-volt distribution system. They all contain rotary converters with the exception of a few in which mercury arc rectifiers will be used.

Details of Power Equipment

The equipment for the generator stations, the distribution system, the railway substations and the locomotives will be built in France. The Westinghouse Electric & Manufacturing Company will supply a large part of the 150,000-volt transmission system, including the transformers, synchronous phase modifiers for the voltage control and the relay protective gear.

For the initial development three generating stations will be utilized. The 150,000-volt lines will connect these with the distant cities Pau, Dax and Bordeaux to the west and Toulouse to the east. At the generating stations 20,000-kva. banks made up of single-phase two-winding transformers will raise the voltage from 60,000 to 150,000 volts. At the substations near these cities the transmission system connects again with the distrition system through stepdown transformer banks of 20,000-kva. made up of single-phase three-winding transformers, lowering the voltage from 150,000 to 60,000 volts. These transformers have a third winding of 6,600 volts for feeding synchronous phase modifiers.

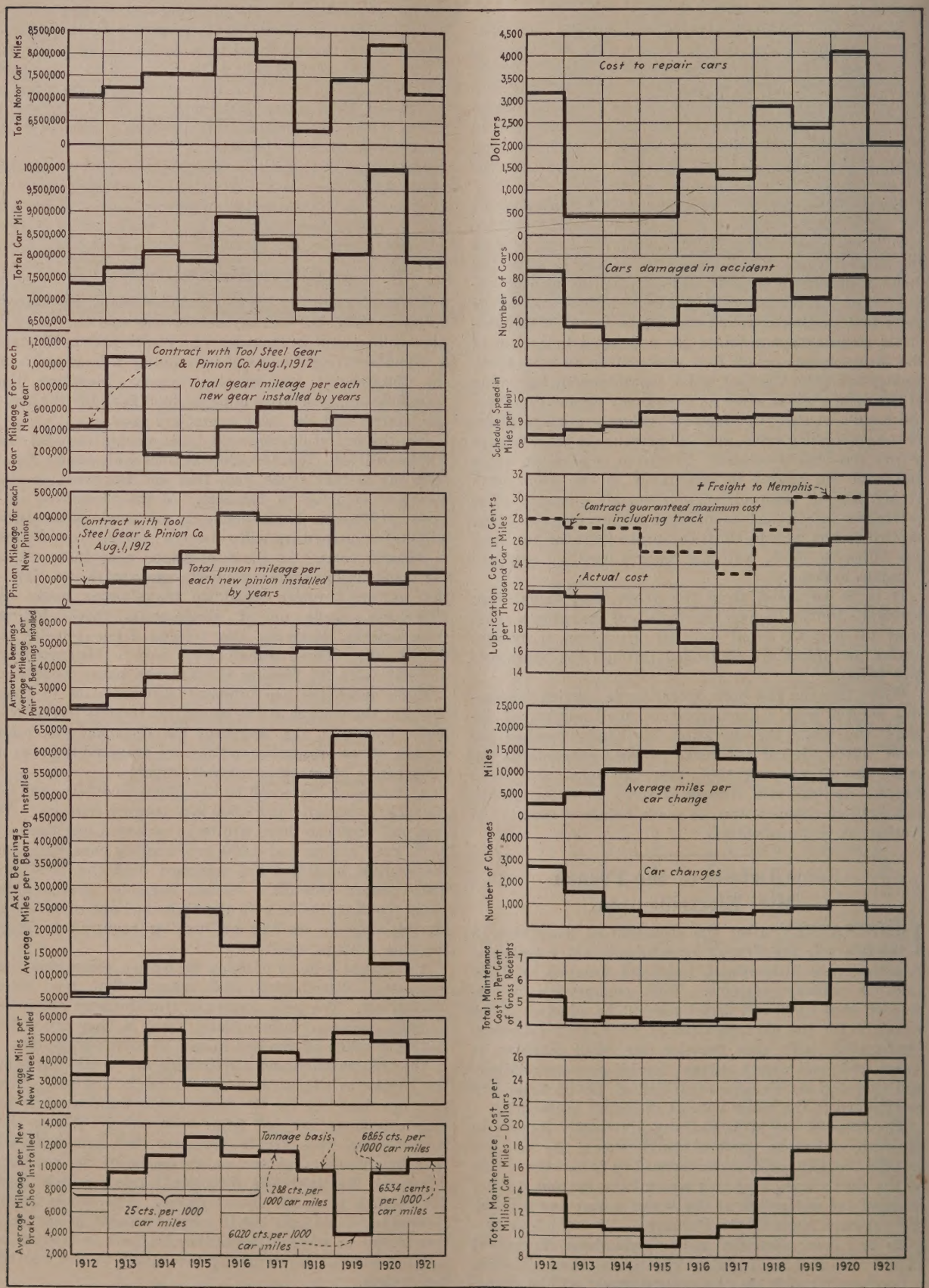
These machines are intended automatically to keep constant the voltage at the substation irrespective of the load. Owing to the length of the lines and the high voltage of the transmission they are designed to cover a wide range of reactive kilovolt-amperes.

At Bordeaux there will be two phase modifiers each of 15,000 kva. capacity and 7,500 kva. lagging capacity. At Dax and Toulouse there will be in each two machines of 8,000 kva. leading and 4,000 kva. lagging capacity. All these phase modifiers are equipped with the Westinghouse patent automatic voltage regulator designed to cause the machine to give the right amount of reactive kilovolt-amperes leading or lagging required to keep the line voltage constant.

A complete scheme of relay protection embracing the generator, distribution and transmission has been worked out. The generators and transformers are individually protected differentially; that is, they are automatically taken off the line in case of internal trouble.

The transmission and distribution are so laid out that the supply to the railway substation is assured. The lines are therefore for the most part in duplicate, except where sections are fed from both sides. Where the transmission lines are in duplicate they are equipped with balanced line protection by means of the recently developed Westinghouse directional relay, which does not require potential transformers. The whole relay scheme is so laid out that in case of trouble in any section of line or piece of apparatus the part in trouble is isolated without interrupting the supply to the rest of the system.

Ten-Year Records of Memphis Maintenance Statistics



Maintenance Records Used as a Bogey

Memphis Street Railway Has Kept Careful Record of the Performance of Its Equipment for Fifteen Years — Data Are Checked Up and Drafts Are Compiled as Incentive to Better Performance

THE Memphis Street Railway is one of the few companies which have kept systematic records of performance for different parts of its equipment over a number of years. These records are now proving invaluable as a means for testing new types of equipment and also the efficiency of the transportation and mechanical departments. Graphs showing records of a number of parts from January, 1908, to January, 1918, were published on page 806 of the issue of this paper for April 27, 1918. Through the kindness of A. D. McWhorter, superintendent of equipment and overhead lines of the company, these records have been brought up to date and are reproduced on the opposite page. On the following page is given an "efficiency report" for December, 1920, and 1921, together with figures for the twelve months of each year. These efficiency reports are made up each month for the month and for the year to date for both the present and previous years.

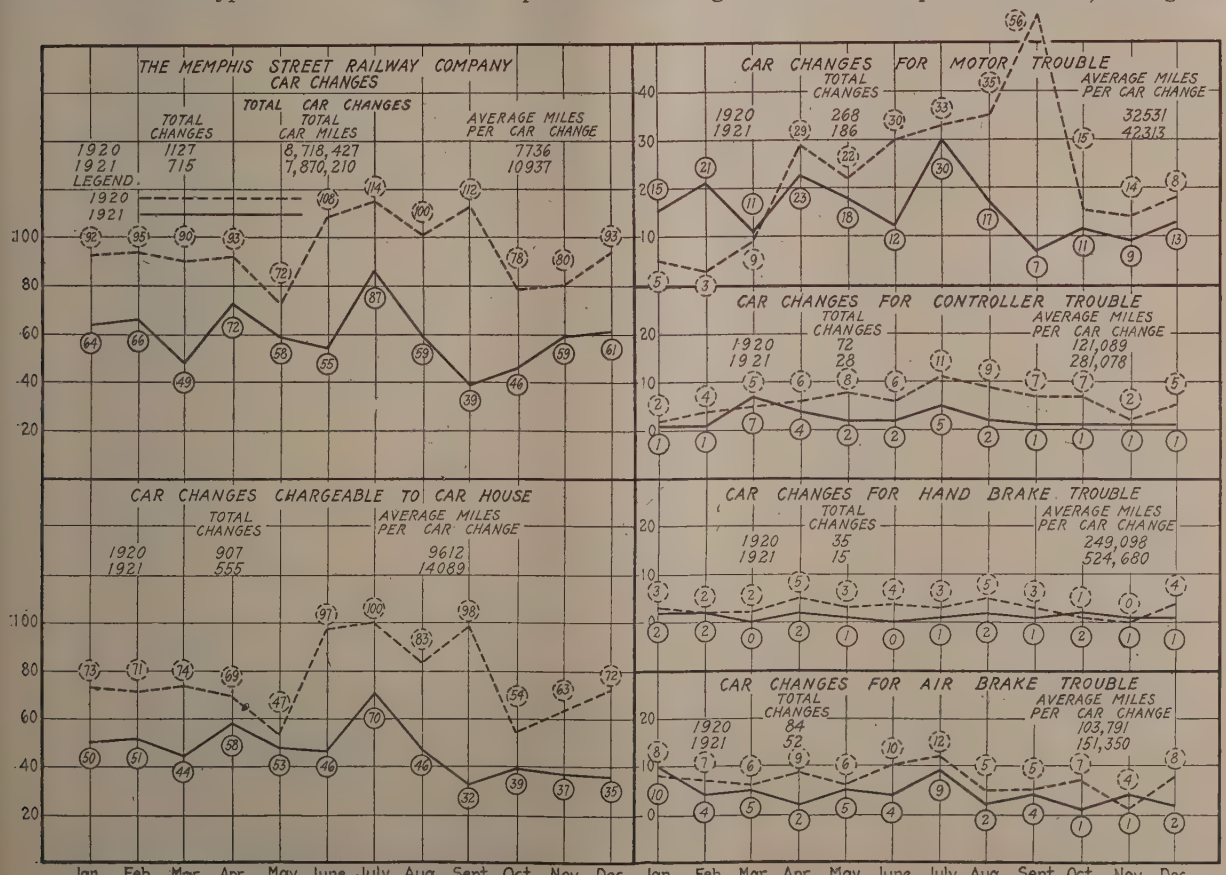
A statement giving the basis upon which the figures in the accompanying table are compiled by the company is published in the April 27, 1918, issue already referred to. This statement shows, for example, that the passenger car-mile figures are obtained monthly from the auditor's office, a separate entry being made for each different type of car. The schedule speed is obtained by dividing the total car-miles by the total car-hours; the number of cars turned out of the different shops is obtained from the daily report of the foreman of the machine shop and the monthly reports of the foremen of the carpenter shop and the paint shop, etc.

In addition the company keeps graphical records by months of the number of car changes and those chargeable to motor trouble, controller trouble, carhouse, handbrake trouble and air-brake trouble. These charts form such a very good guide to the efficiency of the maintenance department that Mr. McWhorter has taken advantage of this fact to stimulate an effort to get better results.

In consequence, photographs of these charts, combining the figures for the current year and previous year, are hung in a conspicuous position in the shop. One of these charts, that for 1920 and 1921, is reproduced.

The original photographs are 12 in. wide by 9 in. high, and they are inclosed in a frame with glass. The practice of preparing and posting these charts is as follows:

On Jan. 1 of each year a new sheet is prepared, and the results of the previous year are placed on it in dotted lines. On Feb. 1 the record for January of that year is drawn on in a solid line, and on the first of each following month the same plan is followed, the figures



THESE RECORDS ARE POSTED IN THE SHOPS TO STIMULATE INTEREST IN BETTER MAINTENANCE

for the current year being shown by a solid line. As each month's figures are charted, a photograph is made and replaces the photograph which has been posted in the shop for the previous thirty days.

A very gratifying degree of interest is exhibited on the first of each month by the foremen of the various departments when the chart is brought up to date. Each takes a great interest to be sure that the record for his division is lower than the previous month and for the corresponding month of the previous year.

EFFICIENCY REPORT—MEMPHIS STREET RAILWAY

Mechanical Department

Note: Memphis & Lake View Ry. Co. Operation Included in This Report	Car-Miles				Car Equipment						
	Month of December		Year to Date		Passenger Cars				Motors		
	1921	1920	1921	1920	Number	Type	Seating Capacity	Age, Years	Number	Type	Age, Years
Passenger Car-Miles						Closed					
Double track motor	378,337	373,506	4,377,926	4,567,073	83	Double truck, 4 motor	44	16	50	G. E. 201-I	7
Max. trac. truck motor	104,024	104,371	1,195,879	1,253,439	25	Max. trac. trk, 2 motor	48	7	2	Westh. 101-B	9
Single truck motor	100,374	176,787	1,542,587	2,399,217	11	Single truck, 2 motor	36	9	156	G. E. 80	15
Double truck trailer	62,729	57,684	703,428	738,835	95	Single truck, 2 motor	30	20	154	G. E. 57	16
Total passenger	645,464	712,348	7,819,820	8,958,564	44	Double truck trailers	54	8	144	G. E. 67	17
Service Car-Miles						Open			18	G. E. 1000	22
Double truck motor	2,704	2,926	36,220	28,227	67	Single truck, 2 motor	50	18	256	G. E. 800	22
Single truck motor	355	858	7,263	6,892	325	Double truck trailer	54	17	16	Westh. 69	22
Double truck trailer	150	403	5,849	4,120	..	Total	..	..	796	Total	..
Single truck trailer	628	.....	1,058	839	..					Air Compressor	
Total service	3,837	4,187	50,390	40,078		Service Cars			25	Westh. D-I-F	7
Total passenger and service	649,301	716,535	7,870,210	8,998,642					1	Westh. D-2-EG	15
					9	Double truck, 4 motor			4	Westh. D-I-EG	12
Total motor miles	1,922,144	2,056,340	22,988,636	25,573,604	10	Single truck, 2 motor			4	Nat. brake DD-4	12
Total air brake miles	485,065	480,803	5,610,025	5,848,739	5	Double truck trailers			38	Nat. brake A-4	14
Total wheel miles	4,788,980	5,021,700	56,758,048	62,361,344	7	Single truck trailers			36	Nat. brake AA-4	17
									13	Nat. Brake AA-1	19
									1	Nat. Brake B-2	17
Passenger car schedule, speed miles per hour	10.02	9.48	9.85	9.53	31	Total service cars			122	Total air compressor	..
					356	Total passenger and service cars			918	Total motor & air compr.	..

Service Performance of Material and Parts	Month of December						Year to Date						Remarks
	1921			1920			1921			1920			
	Units Installed	Service Mi. Per U Installed	Cost per M Miles	Units Installed	Service Mi. Per U Installed	Cost per M Miles	Units Installed	Service Mi. Per U Installed	Cost Per M Miles	Units Installed	Service Mi. Per U Installed	Cost Per M Miles	
Railway armatures wound	4	480,536	.....	9	228,482	.....	140	164,224	.....	126	202,965	.....	
Air compr. armatures wound	1	485,065	.....	0	.....	.....	19	295,264	.....	10	584,874	.....	
Fields, used	1	2,407,209	.....	0	.....	.....	41	697,528	.....	33	952,192	.....	
Commutators, renewed	0	.....	.....	0	.....	.....	16	187,416	.....	7	4,488,906	.....	
Commutators, turned	13	185,169	.....	18	140,952	.....	300	95,329	.....	257	122,266	.....	
Gears, new	6	320,357	.....	10	205,634	.....	80	287,329	.....	104	250,721	.....	
Pinions, new	10	192,214	.....	20	102,817	.....	164	140,174	.....	283	90,366	.....	
Wheels, 33 in., new	94			85			1,122			1,089			
Wheels, 24 in., new	10	38,007	.2000	8	49,720	.2000	98	41,520	.2000	132	44,864	.2000	
Wheels, 21 in., new	22			8			147			169			
Brake shoes, 25-lb., each, new	450	10,642	.57906	575	8,733	.87655	5,264	10,782	.65344	6,437	9,685	.68650	
Armature bearings, pairs	44½	43,194	.....	49	41,966	.....	504½	45,567	.....	602½	42,445	.....	
Motor bearings	18	213,571	.....	10	411,268	.....	492	93,449	.....	253	128,363	.....	
Journal bearings, 9-lb. ea. avge.	49	97,734	.....	40	125,542	.....	572	99,227	.....	583	106,966	.....	
Lubrication	.....	.....	.2529	.....	.....	.4833	.....	.....	.3142	.....	.....	.2641	
Trolley wheels 4 in. copper	76	7,707	.....	124	5,778	.....	1,403	5,103	.....	1,776	5,067	.....	

Car Changes	Month of December				Year to Date				Remarks
	1921		1920		1921		1920		
	Number	Car-Miles Per Change	Number	Car-Miles Per Change	Number	Car-Miles Per Change	Number	Car-Miles Per Change	
Chargeable to car house	35	18,441	72	9,894	555	14,089	907	9,612	
Not chargeable to car house	26	24,826	21	33,921	160	48,936	220	40,720	
Total cars changed off line	61	10,581	93	7,660	715	10,937	1,127	7,736	

Pay Roll, Total Force	Month of December		Year to Date		Remarks
	1921	1920	1921	1920	
Total number men on roll	105	133	109	122	
Average rate per hour	.4746	.5342	.4939	.4875	
Total amount of pay roll	$12,857.30	$17,915.35	$165,683.05	$189,073.25	

Maintenance of Cars and Equipment—Cost (Accts. 29B-32-35-36-38-39-66)	Month of December				Year to Date				Remarks
	1921		1920		1921		1920		
	Amount	Per M.C.M.	Amount	Per M.C.M.	Amount	Per M.C.M.	Amount	Per M.C.M.	
Superintendence, Atc. 29B	$520.00	.83	520.00	.75	6,265.00	.83	6,031.60	.69	
Passenger cars, Atc. 32	9,050.49	14.45	13,311.42	19.23	122,364.60	16.12	117,893.70	13.53	
Service cars, Atc. 35	390.74	.62	88.16	.13	2,868.34	.38	781.24	.09	
Electric equipment, Atc. 36	3,372.54	5.38	5,283.02	7.63	53,603.49	7.06	53,518.65	6.14	
Shop tools and mach., Atc. 38	35.51	.06	79.00	.11	1,020.33	.13	885.80	.10	
Shop expense, Atc. 39	583.76	.93	1,518.69	2.19	8,753.74	1.15	10,894.41	1.25	
Total	13,953.04	22.27	20,800.29	30.04	194,875.50	25.67	190,005.40	21.80	
Memphis & Lake View Railway	381.80	20.00	402.48	20.00	4,576.78	20.00	4,797.16	20.00	
Total	14,334.84	22.20	21,202.77	29.76	199,452.28	25.57	194,802.56	21.75	
Bldg. & structures, Atc. 25B	152.04	.24	309.12	.45	2,122.41	.28	2,139.62	.24	
Car house employees, Atc. 66	4,938.85	7.89	5,981.25	8.64	60,634.38	7.99	63,249.38	7.26	
Total	5,090.89	8.13	6,290.37	9.09	62,756.79	8.27	65,389.00	7.50	
R. & R. expenditures	11,617.66		15,913.08		186,463.68		178,287.39		Mechl. dept. only
R. & R. reserve	7,841.66		3,263.00		45,634.35		51,950.50		All departments
R. & R. total bal. reserve	.....		.....		234,049.54		179,920.06		All departments
Apportionment for maintenance and R. & R. reserve	.....		.....		.....		.....		.....

Why Use Base Plates With Welded Rail Joints?

Base Plates Are Not Needed If a Correct Design of Joint Plate Is Worked Out—Additional Weight of Metal and Increased Amount of Welding Do Not Economically Solve the Problem

By Howard H. George
Engineer Maintenance of Way, Public Service Railway, Newark, N. J.

THE use of base plates with certain types of welded rail joints has recently been adopted by two of the large street railway companies in this country and increasing interest seems to be displayed among electric railway way engineers in their employment for this purpose, especially with those joints of the arc welded type where the base plate is also seam welded to the rail base.

While it is undoubtedly true that a base plate does strengthen the joint, it would seem as though its use, particularly with welded joints, is only dodging the real issue; that it is only a makeshift to overcome the mechanical defects in the splice bars themselves or to bolster up weakness due to defective welding, and that the proper thing to do is to work out a correct design for the joint plates which will eliminate the necessity for base plates. And at this time it might be well to emphasize the fact that it is not the writer's intention to argue the relative merits of the various types of base plates or welding processes now on the market, but rather, as an interested member of the American Committee on Welded Rail Joints, to bring out what he considers to be the salient features involved and to invite as complete a discussion as possible and thus develop all the facts in the matter. If the welding bars are properly designed, there should be no need for base plates. If they are not properly designed, then the present designs should be modified to suit the conditions which must be met. The use of base plates, however, would seem to indicate that something is wrong either with the welding bar design or with the welding process or with its method of application.

In discussing the theoretical side of this problem, an engineer recently said that to secure ideal conditions the moment of inertia of the rail section, as it passes through the joint, should remain constant. This, if possible to accomplish, would certainly provide a theoretically perfect joint, and is exactly what joint plates of the 100 per cent Duquesne, Bonzano and similar types were designed to approximate, the moment of inertia of the two bars at the center of the joint being approximately equal to that of the unbroken rail section. Such a construction is of especial importance in open track with bolted joints, particularly on steam roads where both the wheel loads and the speed are greatly in excess of those usually encountered on electric railways, and where the elastic nature of the roadbed permits relatively free wave action throughout the entire track under wheel loading. In such circumstances, it is essential that the stiffness of the rail at the joints should approximate very closely that of the unbroken rail.

Unfortunately, in no welded joint so far devised can the moment of inertia of all sections throughout its length be constant or equal to that of the unbroken rail, because the moment of inertia of the two bars must be added to that of the rail itself from the rail ends to the outer ends of the joint plates. This makes the rail much stiffer between these points, and the use of a base plate welded to the rail base serves further to increase this moment of inertia. In one case recently called to my attention where base plates welded to the rail base had been used sections of the rail base broke off when the joints were being spiked to the ties. Subsequent investigation showed that the base plates were decidedly concave toward the rail base, and that in the welding process this had apparently caused stresses to be transferred to the rail base, sufficient to cause breakage when the joint was spiked to the ties.

The nearest approach to the ideal condition is probably the butt weld, with the Thermit weld next in line. In the case of bolted joints, although the bolts are drawn up as tightly as possible, there is nevertheless always a slight movement between the fishing surfaces of the rail and splice bars. This tends to permit the rail to act somewhat independently of the bars as far as the wave motion is concerned, so that if the two bars have a combined moment of inertia at the center equal to that of the unbroken rail, ideal conditions have been approximated as closely as possible.

Conditions Different in Closed Track

However, the theory which controls in the case of steam road practice is not so applicable to street railway conditions. This is particularly the case in city paved track, where the roadbed elasticity is either greatly restricted or may be entirely eliminated, in the case of track constructed with a relatively heavy rail on steel ties embedded in a solid concrete base. Thus, an engineer of a large Eastern street railway, whose track is being constructed with a 141-lb. 9-in. grooved girder rail on wood ties laid on natural ballast, said that with this construction he considered there was practically no wave motion in the rail while it was under car loading.

Ties in track in paved streets are usually spaced not over 2-ft. centers. For this span, the moment of inertia in the rails or splice bars usually used is far in excess of that actually required and the extreme fiber stress in bending actually experienced will not approach anywhere near the elastic limit of the material. Actually a rail section with a moment of inertia considerably less than that usually used would satisfactorily meet bending conditions, particularly where the joint plates are welded to the rail and are therefore in a position to develop their maximum resistance to bending. Inequalities in rail and splice bar sections, burred rail ends, etc., are not considered in this discussion as affecting in any way the stresses in the joint by reason of hammer blows which they would cause, as it is assumed that good practice requires the careful grinding of rail heads and the closure of the space between the rail ends for all welded joints and that in every case this will be done as well as practical considerations will permit.

In the case of standard T-rail sections, there is really not as much difference between the moment of inertia of rails and the standard sections of splice bars which are ordinarily furnished as one might imagine from merely a casual consideration of the subject. To be definite, the "Carnegie Steel Handbook" gives the moment of inertia of an 80-lb. A.S.C.E. rail section as 26.38, while that for two standard splice bars is 23, a difference of only 3.38. In the case of an 80-lb. A.R.A. type-A rail, the moment of inertia is 28.80, while that for two standard splice bars is 26.86, a difference of only 1.94. It should be a simple matter so to design the splice bars at the center as entirely to eliminate this difference, should this prove to be necessary or the desirable thing to do. In the case of the butt-weld joint, although the difference is undoubtedly not very large, an analysis will show that it does exist because of the enlarged section due to the squeezing out of the hot metal when the rail ends are pulled together by the hydraulic press. With the girder rail sections, however, the difference between the moments of inertia of the unbroken rail and its standard splice bars is considerably greater. In the case of L.S. 101-486, a 7-in. curved head tram, for example, the moment of inertia of the rail is 63.21, while that of a pair of standard splice bars is only about 24. The moment of inertia of the A.E.R.E.A. standard 7-in. grooved girder rail section L.S. 122-467 is 77.46, while that of the splice bars is only about 26.3. But, as explained above, conditions in paved street railway track construction do not require that the two should have equal moment of inertia to the same extent as in steam road practice.

Users of joint base plates certainly show a lack of confidence in either the strength of the bars or that of the seam welds. A better solution of the problem would seem to be to design the splice bars so that they would have whatever additional strength the situation requires and at the same time arrange the portion where the welds are to be made to facilitate to the greatest extent the process of welding. This will never be satisfactorily accomplished by office or laboratory studies alone. It is going to require considerable experimentation with different types and the knowledge of the men in the field that has been gained as the result of many unsatisfactory experiences.

Experience of Public Service Railway

The Public Service Railway has welded approximately 130,000 joints on both old and new rail, covering a great many different sections in both open and closed track, with the Lorain bar weld process, and in not a single instance has a base plate been used or considered necessary, although several radical changes in the design of the welding bars had to be made since 1907 when the use of this type of joint was begun by the company. During the past few years we have also welded about 15,000 joints with the arc-weld process and the same statement applies to these joints, except that no material change has ever been made in the joint plate design from the usual typical standard bolted type.

To the best of my knowledge and belief it is an extremely rare occurrence to find a welded joint failure due to breakage of the bars at the rail ends or any other part of the bars. Almost without exception such failures as occur have been due either to pulling apart of the bar from the web of the rail at the point of weld, generally caused by failure to accomplish a proper weld, or, as is by far more frequent, by breakage of the rail itself just outside the outer weld, yet the total annual percentage of breaks is not excessive, considering all the circumstances of the rail welded. These results indicate very strongly that for ordinary street railway conditions (the track described being entirely of the ballasted type with wood ties laid on 2-ft. centers) the splice bars or weld bars commonly furnished for track joints have sufficient strength to meet any loading conditions ordinarily imposed on them.

It would therefore seem to be the logical conclusion that not only are joint base plates unnecessary, but they constitute an economic waste, both in total weight of metal in the joint and in the amount of welding required. Certainly, if the splice bars can be properly designed for welded joint work, and there is no reason to believe otherwise, it should result in a much more economical joint. A base plate will probably add about $2 to the cost of a welded joint, including the cost of the plate and the extra labor and welding involved, and it is very unlikely that the additional cost of a correctly designed welding bar would be anything like this amount more than the cost of the welding plates now being used. In open track the problem of rail joint breakage with the bolted type of joint has been very largely solved by the design of splice bars with depending flanges through the center section where the bending stresses are greatest, and it may be that a modification of splice bars of this general type to meet welding requirements and the introduction of this feature in the design of splice bars for girder rails will prove to be the solution of the problem. With the design of the plates properly worked out from the standpoint of mechanical strength as a beam, it should not be a difficult matter satisfactorily to complete the details of design from the standpoint of welding requirements, both as to the required length and cross-sectional area of the weld metal necessary to hold the plates in position indefinitely and, at the same time, provide the necessary electrical conductivity.

Convenient Jig for Boring Axle Brasses

Jig for Boring Axle Brasses

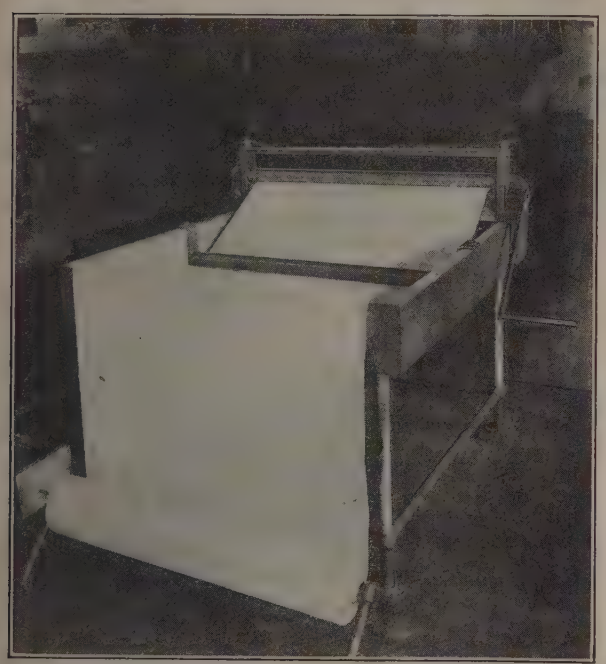
THE accompanying illustration shows a method of boring axle bearings as used by the Northern Ohio Traction & Light Company, Akron, Ohio. A special jig arranged to fit the headstock of the lathe is used. It has two clamping parts which clamp around the axle brass and hold it in position so that it can be readily bored out.

Equipment and Its Maintenance

Short Descriptions and Details of New Apparatus of Interest to the Industry. Mechanical and Electrical Practices of All Departments

Convenient Machine for Oiling Canvas

THE New York State Railways uses canvas pads between the field coils and the frame of railway motors in order to insure that the fields are kept tight. These canvas pads are oiled with linseed oil to insure their durability and to keep out moisture. The accompanying illustration shows a machine designed and built by F. W. Seeney, superintendent of shops for the railway company in Rochester. It consists of a wooden



MACHINE FOR OILING CANVAS

box with zinc lining, 42 in. x 48 in. x 7 in. deep, through which the canvas is fed by means of rollers. A roller in the center of the box under which the canvas passes forces this into the linseed oil, while two steel rollers at the end act as a wringer, thus removing the excess oil and at the same time pulling the canvas through so that it is readily rolled up. The box in which the oil is placed is supported by a 1-in. iron pipe framework. The two rollers which serve as a wringer are operated by means of a lever on the outside end, while the two inside ends of the rollers are connected by herringbone pinions. These are some which were removed from old compressors. The rollers are kept in contact by means of two springs and the pressure can be adjusted as required. Canvas 36 in. wide is used. This is removed from a roll which is placed in position on two pipe supports which rest on the floor. After the canvas has passed through the linseed oil it is put in a drying kiln for from ten to twelve hours, when it is then ready to be cut into pads.

Cars for Boston Tunnel Operation

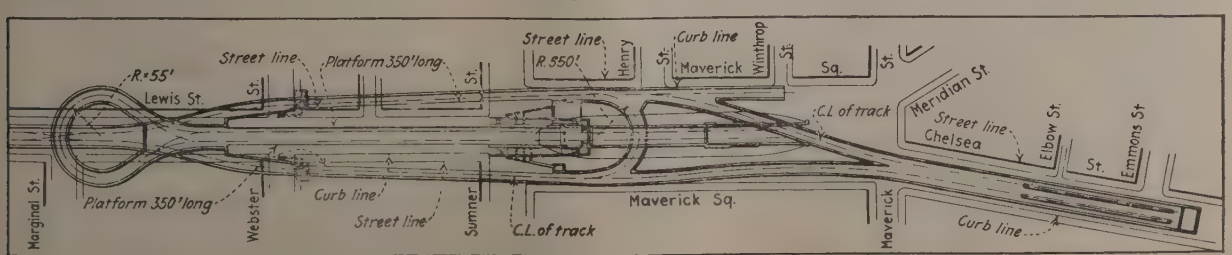
THE Transit Department of the city of Boston has made substantial progress in the construction of an underground terminal and loop at Maverick Square, at which point surface cars from East Boston and Chelsea will transfer passengers to the trains which will run from this terminal to Bowdoin Square. The Boston Elevated Railway will provide steel trains for this operation of a type similar to those now used in its elevated service. A comparison of the new cars with existing elevated rolling stock shows:

COMPARISON OF ELEVATED AND BOSTON TUNNEL CARS

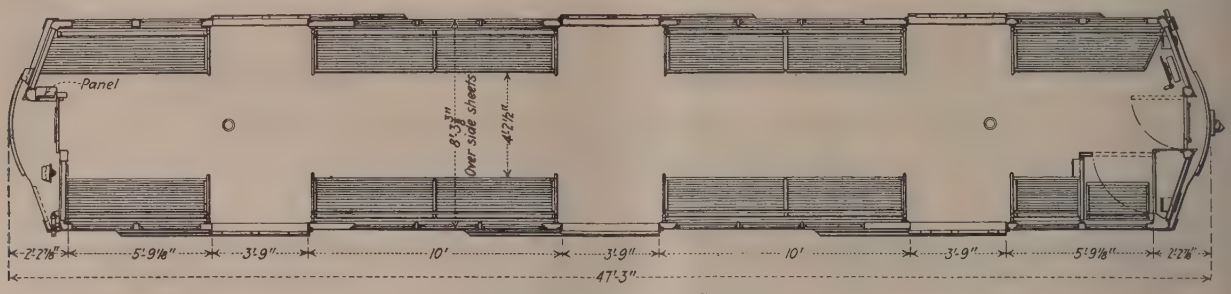
	No. 8 Elevated	East Boston Tunnel
Length over-all	46 ft. 7¼ in.	47 ft. 3 in.
Width over-all	8 ft. 9 7/16 in.	8 ft. 7 in.
Number of seated passengers	44	44
Weight of car light	69,450 lb.	44,000 lb.
Weight, pounds per seated passenger	1578.4 lb.	1000 lb.

The new cars will be provided with three door openings on each side and will have longitudinal seats. As the cars will be operated in trains of two, four or six units, the cars will be permanently connected and will be separated only for repairs. With this method of operation, there will be a motorman's cab in one end of each car only, the cab ends forming the ends of the two-car unit.

On the present rapid transit cars the doors now are actuated by compressed air, which allows for the possibility of leakage of air at the various joints in the piping as well as at the door operators. On the new cars the doors will be operated by small motors with direct control connections to the operator. With this arrangement any air leakage or frozen pipes in cold weather will be obviated. The doors will be controlled



PLAN OF BOSTON TUNNEL EXTENSION



FLOOR PLAN OF NEW CARS

from the center of the two-car unit in a similar manner to the arrangement of the present cars.

The lighting of these cars will be provided by five 94-watt lamps with white opal reflectors as compared with the present arrangement of small lamps.

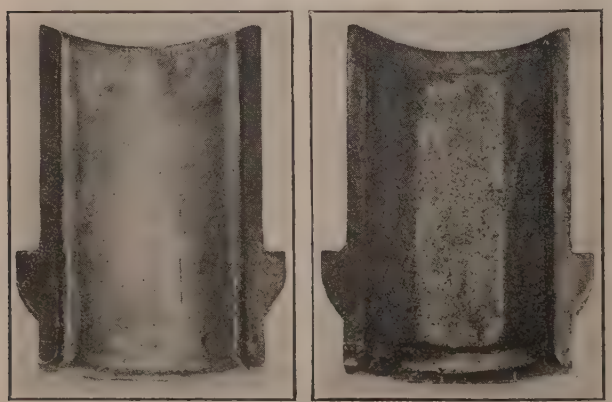
A new feature will be the "variable load brake," arranged so that the braking effort is increased as the passenger load is increased in an effort to obtain the maximum efficiency of the brakes at all times.

The East Boston Tunnel was originally constructed for surface cars and opened to the public on Dec. 30, 1904, as far as Scollay Square at a cost of $3,595,000. Its later extension to Bowdoin Square was opened to the public on March 18, 1916. The extension cost $2,389,000, making the total cost of the tunnel as it now exists $5,985,000, and up to the present it has been operated with surface cars in two and three-car train units.

The total traffic passing through the tunnel in both directions daily is 80,000, and under existing methods of operation it is impossible to provide adequate service. It is estimated that the construction of the terminal and changes in the tunnel itself will cost $2,750,000, and will make possible the operation of four-car trains and ultimately trains of greater length. This will permit third-rail operation with automatic safety stops, and in connection with this change the Boston Elevated has designed and contracted for forty steel cars for this service.

Anchoring Bearing Linings

THE accompanying illustration shows a type of journal bearing developed by J. E. Hester, master mechanic of the Union Traction Company, Anderson, Ind., to provide for anchoring the bearing lining and to eliminate the necessity for machine work and tinning. The portion of the bearing which is to receive the lining has beveled flanges at either end and at the sides, so that when the lining is poured into place it cannot get out of position. The bearing was designed primarily for use with lining metals, such as "Frary" or "Promet" metal, that have no tin content and that cannot be sweated to brass or bronze, but the scheme will work satisfactorily with any kind of lining metal.

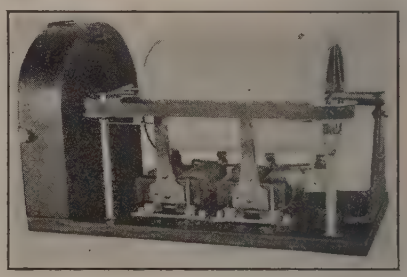


JOURNAL BEARING BEFORE AND AFTER LINING HAS BEEN INSTALLED

Headway Recorders Assist in Checking Schedules

THE USE of automatic headway recorders for checking schedules in Baltimore was referred to in a letter from Carl P. Nachod, published in the *Electric Railway Journal* for June 3, page 901. A further example of the use of such recorders for keeping cars on time is given herewith and is for a Middle West city.

Results for the month of April, 1922, on this road show that less than 1 per cent of all the cars in the city were off schedule. During the month there were 34,610 total scheduled car passes, of which 34,076 were checked by the recorder instruments. Of these 157 cars were two minutes or more early; 167 cars were five or more minutes late. This makes the total number of cars off schedule as 324 or 0.95 per cent. The 157 cars ahead of time totaled 315 car-minutes early and the 167 cars late totaled 960 car-minutes late.



HEADWAY RECORDER REMOVED FROM WEATHERPROOF BOX

Delays caused by general traffic conditions occurred on eighty-four cars which totaled 474 car-minutes. These were made up of delays due to heavy travel on thirty cars, totaling 173 car-minutes; delays due to weather conditions for one car, with 8 car-minutes; accident delays on five cars totaling 31 car-minutes, and delays due to cars being off schedule for forty-eight cars totaling 262 car-minutes. Forty-three cars were off schedule due to operating failures, totaling 248 car-minutes. These operating failures were divided into various causes, as follows: Track, nine cars, 50 car-minutes; power, four cars, 29 car-minutes; rolling stock, fifteen cars, 84 car-minutes, and transportation, fifteen cars, 85 car-minutes.

The delays due to foreign causes involved twenty-nine cars with a total of 167 car-minutes. Of these three cars or 24 car-minutes were due to vehicles on the

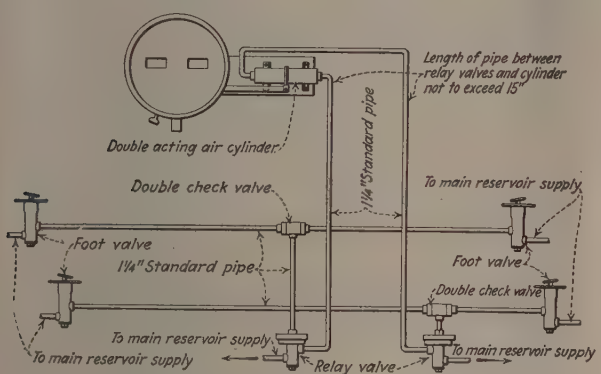
track; five cars or 29 car-minutes were due to bridges; twenty-one cars or 114 car-minutes were due to steam railroads; and eleven cars, totaling 71 car-minutes, were late from a previous trip.

The total recorder hours for the month of April was 2,880, fifty-eight of which were lost. Of those lost twenty-four were due to the stoppage of the recorder clock, thirty hours were lost due to the operator forgetting to wind the clock, and there was a period of four hours in which the cars were off schedule and where no records were made. These fifty-eight hours amount to 2 per cent of the total recorder hours for the month.

What's New from the Manufacturers

Pneumatic Register Ringing Device

PNEUMATIC operation for overhead registers has been developed by the Pneumatic Register Ringing Device Company, St. Louis, Mo. This device is intended to simplify register ringing and eliminate the usual rods, brackets, and ropes extending throughout the car. To operate the register a double-acting air cylinder is



PIPING DIAGRAM FOR PNEUMATIC OPERATION OF DOUBLE-ACTING REGISTER ON DOUBLE-END CAR

mounted alongside and this is piped through a relay valve, which in turn is connected to foot valves for operation. The equipment is arranged to control either single or double-acting registers. The accompanying diagram of piping is for a double-end car with double-acting register.

Sliding Type Trolley Wheel

A TYPE of trolley wheel which has a sliding resilient motion when traveling in the forward direction, but which can rotate freely in the reverse direction has been designed and patented by Joseph L. Gutweiler and Frederick W. Kublin of St. Louis, Mo. A test of this type of wheel, mounted on a large freight locomotive, was made on the Decatur division of the Illinois Traction System.

The construction of the wheel is shown in the accompanying illustration. It consists of a steel outer rim which has a groove of the usual shape to receive the trolley wire. A split friction ring is fitted to the inside of this outside portion and a heavy flat coiled spring is connected between this friction ring and a clutch which is connected to the hub and shaft through a pawl. This construction gives the wheel a resilient motion under ordinary conditions when the car is traveling forward. The coiled spring holds the wheel so that sufficient tension is provided to give considerable friction between the friction ring and the outer portion of the wheel. However, should the wheel be subjected to a blow or excessive pressure, it can rotate in the forward direction. Thus when traveling forward around sharp curves the friction will sometimes be sufficient to cause the wheel to rotate. The same condition prevails under bridges, and at other locations where there is high pressure between the wheel and the wire. This occasional rotation in the forward direction is an advantage in providing a new spot for the sliding contact, so that the entire surface of the groove is used at frequent intervals.

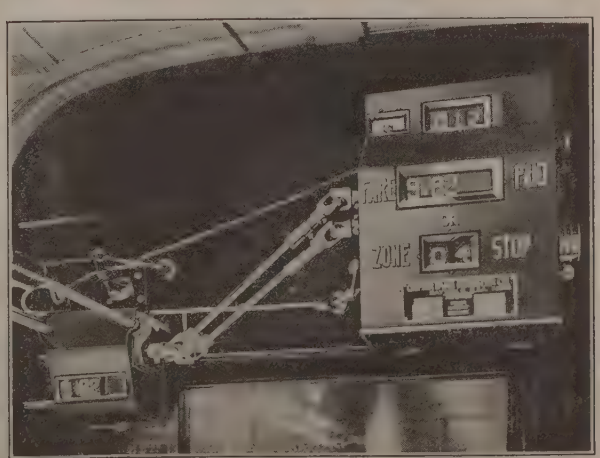
NEW TYPE SLIDING TROLLEY WHEEL

While the wheel is normally a sliding contact type when traveling in the forward direction, the hub and pawl construction permits free rotation of the wheel when the car is being backed up and thus prevents any liability to dewirement. The size and construction of the wheel are such that standard trolley harps can be used.

New Fare Register

THE Ohmer Fare Register Company has placed on the market its new No. 62 detail fare printing interurban register. The new register is designed for use where a very large variety of cash fare values are handled as well as the usual paper fares, and where a detailed printed record of each fare is desired with the origin of the fare indicated and the registrations in each zone shown.

The register has a capacity for handling any cash fare from 1 cent up to $9.99. It also handles the various non-cash denominations such as tickets, pass, commuter, round-trip, half-fare, coupon, mileage, school,



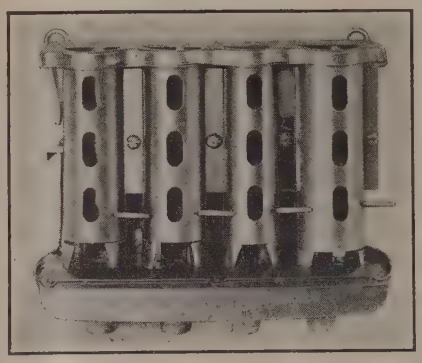
NEW REGISTER GIVES DETAIL RECORD OF EACH FARE

transfer, etc., all of which may be registered according to designated cash values as well as under their particular denominations if it is so desired.

The amount and the classification of each fare is printed in the record, together with its consecutive number and the number of the zone in which it was collected. The register is operated in a manner similar to other types of Ohmer registers by means of two rods and a cord. The auxiliary indicators which are placed at each end of each compartment differ considerably from the dial indicators used in other types of Ohmer installations. The registration is completed by pulling the cord.

An auxiliary cord is connected with the zone indicator at the bottom of the register. As a new zone is entered this cord is pulled and the zone indicator advances one count. The zone number is printed on the record with the amount of the fare. The zone indicator counts up to 99. When the direction indicator is changed at the end of the line and the trip count set back to zero, the zone count reverses automatically. Improvements provide against the register getting out of order and for convenience in operation.

New Features in Change Carrier



IMPROVED CHANGE CARRIER

THE Cleveland (Ohio) Fare Box Company is distributing an improved type of Nelson change carrier. The size, weight and number of parts have been reduced from the type previously sold. To avoid breaking special attention has been given to the springs used. The change carriers are made with four tubes, but the end frame is so designed that an extra tube for pennies or tokens can be added if desired. A positive safety lock is provided on the ejector adjustment. Other details were published in *Electric Railway Journal* for Sept. 17, 1921, page 448. The tubes are 4 in. long.

National Personnel Association Formed

TO STUDY the human factor in American business and industrial life, to solve the problems which confront the management of the nation's industrial enterprises, and to bring about a better understanding of the labor question, leaders of organized engineering, representatives of large industries, insurance companies, railroads and publishers, and members of university faculties have organized the National Personnel Association.

The announced purpose of the movement is "to advance the understanding of the principles, policies and methods of creating and maintaining satisfactory human relations within commerce and industry." The new organization takes over the activities of the National Association of Corporation Training and the Industrial Relations Association of America. It will aim to aid business executives in solving problems of personnel administration. Co-operative research will be conducted on a nation-wide scale, and close relations will be established with colleges and universities in carrying out an extensive educational program.

W. W. Kincaid of Niagara Falls, head of the Spirella Company, has been named president of the new organization. Earl B. Morgan, the Curtis Publishing Company, Philadelphia, is vice-president, and Montague A. Clark, E. I. du Pont de Nemours & Company, Arlington, N. J., is treasurer. W. J. Donald, 20 Vesey Street, New York City, is the managing director and secretary.

An executive committee and a board of directors, representative of many of the country's biggest institutions, have been chosen. Members of the executive committee, whose election has just been announced, include: Sam A. Lewisohn, Miami Copper Company, New York; John McLeod, Carnegie Steel Company, Pittsburgh; J. M. Larkin, Bethlehem Steel Company, Bethlehem; C. S. Ching, United States Rubber Company, New York; Ben A. Franklin, Strathmore Paper Company, Mittineague Falls, Mass.; W. H. Winans, Union Carbide and Carbon Corporation, New York; J. W. Dietz, Western Electric Company, New York; Harvey G. Ellers, Armour & Company, Chicago; Francis Farwell, Worthington Pump & Machinery Corporation, New York; Milton D. Gehris, John B. Stetson Company, Philadelphia; Harry A. Hopf, H. A. Hopf & Company, New York; George F. Quimby, Associated Industries of Massachusetts, Boston; S. R. Rectanus, American Rolling Mill Company, Middletown, Ohio; and Arthur H. Young, International Harvester Company, Chicago.

The board of directors includes a long list of prominent men, among whom are: L. P. Alford, New York, vice-president American Society of Mechanical Engineers and a member of the executive board of the American Engineering Council; L. W. Wallace, executive secretary Federated American Engineering Societies, Washington, D. C.; Alvin E. Dodd, United States Chamber of Commerce, Washington; E. S. McClelland, Westinghouse Electric & Manufacturing Company, East Pittsburgh; Miss M. T. Reuse, American Telephone & Telegraph Company, New York; F. W. Thomas, Atchison, Topeka & Santa Fé Railroad, Topeka; Kendall Weisiger, Southern Bell Telephone Company, Atlanta.

Sixteen committees, which during 1922 will make reports on national economic and industrial problems, have been selected. The sponsors of the movement, it was said, feel that the work of the association is certain to have a beneficial effect on industry and commerce generally.

American Association News

Procedure for Obtaining Coal

THE American Electric Railway Association has sent to all member companies information as to the suggested procedure for obtaining essential fuel supplies.

In general there will be two main classes of conditions which may confront electric railways. They may have a contract with a coal company which has mines in operation, or they may have no contract, or the contract may be with a company which is not producing coal. In either case, as a utility, the railway automatically belongs in priority Class No. 2, under Interstate Commerce Commission Order No. 23.

If the railway has a contract with a company now producing coal it should communicate at once with the coal contractor and call attention to the fact that the railway as a utility belongs in priority Class No. 2; ask him to see to it that all bills of lading for coal consigned clearly indicate that the coal is for a public utility and is furnished under priority Class No. 2 and request that he take vigorous steps to have his full share of cars allotted to him for handling the coal.

Then, if the coal company is unable to get adequate car allotment, or if the coal is seriously delayed by car congestion, or other railroad troubles, or if the coal is confiscated, advise J. P. Jackson, national representative of the joint fuel committee of the Utilities Associations, 949 Munsey Building, Washington, D. C., giving full information, including a copy of all im-

portant correspondence and papers in the case.

A railway with no contract or one with a company not producing coal, should buy coal at "Hoover price," if possible, and proceed as above.

If the condition becomes desperate, whether the railway has a contract or not, it should apply to the state fuel authorities for approval of a Class 1 priority application. Form No. 50 should be filled out, together with affidavit and guarantee of payment. In addition, the Washington representative, Mr. Jackson, should be notified, giving full particulars. Class 1 priority will be granted only in cases of very great emergency where shutdown would be serious to the public welfare.

The Federal fuel distributor, Mr. Spencer, specifically requests that utilities avoid bidding against each other for coal and thus raise the price. Co-operation with the authorities both on matters of supply and price is essential. It should be appreciated, however, that the obligation of railway franchises and to the public require the uninterrupted operation of these public services and every company will spare no effort to insure continuity of service.

T. & T. Executive Committee

ON JULY 29 a meeting of the executive committee of the Transportation & Traffic Association was held at the Secor Hotel, Toledo. Those in attendance were L. H. Palmer, president; G. T. Seeley, first vice-president; and T. C. Cherry, J. H. Hanna, C. E. Morgan, W. H. Boyce, H. B. Flowers, E. M. Walker, and James W. Welsh, executive secretary. The meeting was called primarily to review reports and prepare for the Chicago convention.

The first matter taken up was the suggestion of Past-President Stevens at the last convention that the number of vice-presidents be changed and that the work of the association be begun each year more promptly after the close of the convention. The decision was reached not to recommend any change in the constitution with regard to the vice-presidents, but to adopt the second recommendation of Mr. Stevens. During the coming year committees will be instructed to hold their first meeting not later than Dec. 1.

The secretary reported that he had included in his Aug. 1 service letter an inquiry on the present use of the classification of freight accounting.

The reports on merchandising transportation and traffic regulations were then presented and approved. An abstract was also presented of the forthcoming report of the committee on safety. It was referred to L. S. Storrs, publication committee, for final approval. C. E. Morgan outlined the report of his committee on one-man car operation, which is to come up for final approval at the next meeting of the executive committee of the American Association, to be held on Aug. 25.

It was decided not to make any additions to the interurban rule book. The secretary was instructed to compile a list of the special requirements on safety devices adopted by the various public utility commissions.

Plans to stimulate discussion at the various sessions were then discussed. It is expected that there will be a discussion of the weekly pass during the report of the committee on merchandising transportation, and of turnstile cars and light-weight interurban cars at the meeting at which one-man car operation will be considered. President Palmer explained that at the meeting at which the report on traffic regulations and safety work will be considered, the Claims Association will be asked to participate in the discussion.

It was decided not to make a general distribution of advance copies of the reports this year, but the reports will be printed and copies will be sent to those who expect to make a formal discussion of them or who make special requests for such reports. Printed copies of the reports will also be available at the meetings.

Executive Committee of the Engineering Association

A BRIEF NOTE was printed in last week's issue of this paper about the meeting of the executive committee of the Engineering Association in New York on Aug. 9. It was an all-day session, as this is the final meeting of the whole committee before the time of the October convention, and much business was transacted.

Resolutions were passed on the death of A. B. Stitzer, vice-president of the association. They will be engrossed and signed by each member of the committee and then will be forwarded to the family of Mr. Stitzer.

Secretary Welsh and G. C. Hecker, special engineer, were asked to investigate and report on some method by which headquarters can be advised of legislation passed in any state regarding engineering specifications. E. M. T. Ryder, at the request of Mr. Cram, outlined the work of the welded rail-joint committee of the American Bureau of Welding, and explained how his subcommittee had co-operated with that committee. He also urged the authorization of an appropriation of $20,000 from the American Association to finance the proposed test on rail joints recommended by the way committee. At the request of Mr. Kimball, Messrs. Cram and Ryder will prepare a budget of the expenses and a statement of the reasons for engaging in the test, and the matter will be presented to the executive committee of the American Association at its next meeting. A request from H. H. George to have certain German pamphlets on wood preservation translated was considered. This request was indorsed by Mr. Cram, who explained that these pamphlets described the use as a preservative of sodium fluoride, with which there had been very little research work in this country, and the results in Germany indicate that this material has great possibilities as a wood preservative. The pamphlets were turned over to Mr. Harte, who will have this work done.

At the suggestion of Mr. Harte, the president was authorized to appoint a special committee to prepare suitable specifications covering air tanks for use on electric railway cars to be offered to the boiler code committee of the American Society of Mechanical Engineers in connection with the specifications which that committee is developing for unfired pressure vessels. The special committee was also asked to request that the boiler code committee include in its specifications pressure tanks used for oil burning and gasoline burning heated torches, and to co-operate as far as possible with the special research committee of the American Bureau of Welding, which is also studying the subject of pressure tanks.

An invitation was then read from the commercial attaché of the Brazilian Embassy to the association to send a representative to the International Congress of Engineers, to be held under the auspices of the Brazilian Government at Rio de Janeiro, Sept. 7 to 30. The committee voted to recommend to the American Association that V. L. Havens, editor *Ingeniería Internacional*, be appointed representative of the association.

It was decided to appoint a special committee to (1) study and make suggestions for the revision of the mechanical form of the *Engineering Manual* and (2) supervise from year to year all specifications adopted and revised and see that the *Manual* is kept up to date, co-operating with the secretary's office, particularly with respect to elimination of errors in specifications. This committee will be made up of three members of the executive committee, with terms of office so arranged that after the first year there will always be at least one member of the committee having had one or more year's experience on the committee.

A set of rules to govern the discussion of papers at the convention was submitted and accepted, and the secretary reported that the chairmen of the different committees had been asked to suggest the names of men to discuss their reports. The report was also read of the committee on reorganization of the methods and practices of the Engineering Association. It evoked a great deal of discussion, but no final action was taken on it. The tentative program for the October convention was approved.

Special reports were also received from F. J. White and C. R. Harte, representatives on the sectional committee of the A.E.S.C. on the standardization of wires and cables, and from F. McVittie, representative on the sectional committee of the A.E.S.C. on lightning protection. The members of the executive committee expressed their appreciation of the work of the representatives of the association in making these special reports.

News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

All Buffalo Places Filled

Lines There Now Fully Manned—Company Preparing to Start Up in Niagara Falls

Employees of the Philadelphia Rapid Transit Company who have been in Buffalo operating cars for the past month, because of the strike of trainmen on the local and interurban lines of the International Railways, are starting to return home. Their places are being filled by permanent employees recruited in all parts of the country.

NEW ORGANIZATION NOW FUNCTIONING

In this manner the International is building a new organization of trainmen and a new permanent seniority list has been started so that employees on strike who return to work will be reemployed only after they have applied for work as new employees and will thus be required to take their places at the foot of the seniority list. Just now the company has more men than is necessary to give normal service on all local and interurban lines.

Traffic has increased on the West Side and the interurban lines, but practically no passengers are being carried on the East Side lines, which serve sections of the city populated largely with foreign-speaking people.

Despite the decision of the courts that the jitneys are running in defiance of the law, few arrests are being made and many people are using this means of transportation. Jitneys are running without distinguishing signs and fares are collected in the form of donations.

In his decision which followed the appeal of the municipal authorities from the ruling of Justice Pooley that the Mayor should enforce the state law against jitneys which have not secured the necessary permits, Justice Krause of the Appellate Division stays the mandamus order until an appeal can be taken to the Court of Appeals in September. He has ruled, however, that:

MAYOR MADE RESPONSIBLE

The stay is not a license for unlawful jitney service, nor does it lessen the duty of the Mayor to enforce the law. It merely suspends during the pendency of the appeal specific directions contained in the mandamus order, leaving the Mayor unhampered in the discharge of his official duties, which he has sworn faithfully to discharge.

The court also rules that:

It is unlawful to operate upon the streets of the city a bus line, stage route or motor vehicle line or route, or any vehicle in connection therewith or any vehicles carrying passengers at the rate of fare of 15 cents or less for each passenger, within the limits of the city, or in competition with another common carrier which is required by law to obtain the consent of the local authorities, without the consent of the local authorities and a certificate of convenience and necessity from the Public Service Commission. Unlawful jitney service is a misdemeanor under the provisions of section 29 of the Penal law (People *ex rel.* Weatherwax *vs.* Watt, 115 Misc. 120; 197 A. D. 929).

At a meeting of the general executive board of the Amalgamated in Detroit, a fund of $15,000 a week was voted for the support of the strikers in Buffalo. It is reported that no strike benefits have been paid although the strike is now in its eighth week.

Owl car service has been restored on several of the local lines of the International, making complete the restoration of local service. Early in the week it was proposed to start local service on the lines of the International in the city of Niagara Falls. Service already is being given on the Park & River division and across the upper steel arch bridge over the Niagara gorge. Local service has not been started in the city of Lockport. Cars are being operated over the Olcott-Lockport division and fruit trains hauled by electric locomotives are being handled over this division.

Judge Harlan N. Crosby, sitting in equity term of the Supreme Court of Erie County on Aug. 16, granted the company's request for a blanket injunction against the Buffalo Jitney Owners' Association and its 200 members restraining them from operating jitney and bus lines within the city. The injunction is non-returnable so that jitney drivers who are arrested by city police or detectives of the International will be brought directly into the Supreme Court and committed to jail for contempt. Passengers riding in jitneys when arrests are made will be taken to police headquarters where they will be required to make signed statements. President Tulley of the railway believes the blanket injunction will put an end to the unfair jitney competition.

Arbiters Decide on Cut of Five Cents

According to a decision of the arbitration board employees of the Memphis (Tenn.) Street Railway must accept a decrease of 5 cents an hour instead of receiving an increase of 7 cents which the men had sought. The reduction is retroactive to Aug. 1.

According to the findings of the board, first year men will receive 38 cents an hour; second year men 43 cents an hour and third year men 48 cents an hour. The wage contract which expired on July 31 called for 43, 48 and 53 cents.

The decision was signed by F. N. Fisher representing the railway and Judge A. B. Pittman, the neutral member. Considerable agitation has been aroused over the decision and a mass meeting of motormen and conductors has been called by union leaders.

Bar Association Condemns Bacharach Bill

At sessions of the American Bar Association held in San Francisco, Aug. 7 to 11, discussion of the Bacharach bill and similar legislation resulted in the adoption of resolutions placing the association definitely on record as opposing that type of legislation. At a meeting of the public utility section of the association on Aug. 8 the following resolution was adopted:

Resolved, That the section on public utility law of the American Bar Association hereby expresses the emphatic opposition of its membership to the Bacharach bill, now pending in Congress (H.R., 10,212), and to any similar legislation designed to limit or destroy, as to any particular class of litigants or rights, the present equitable powers of the federal courts to enforce the guaranties of the Federal Constitution for the protection of persons and property.

Resolved further, That the section asks its chairman in his report to the association to present at least in outline the considerations which have been developed in the discussions before the section as demonstrating the extreme unwisdom of any such radical curtailment of the Federal judicial power.

Resolved further, That the chairman of this section and the special committee created at to-day's session are authorized in behalf of the section to take such further steps as in their judgment may be advisable to bring about an indorsement by the association of the action of its committee on jurisprudence and law reform in actively opposing the Bacharach bill at the present session of the Congress, and also to support before the association any suitable resolutions which may be offered in condemnation of that or similar legislation.

At a general session of the association on Aug. 10, the committee on jurisprudence and law reform, Henry W. Taft, chairman, presented its report, including as a part of that report the resolution adopted by the public utility section and expressing definite opposition to the Bacharach bill as follows:

Three hearings have been had upon this bill. At one of these a member of this committee, Mr. Harriman, attended and pointed out the objections to it upon the grounds referred to in the previous reports. The chairman also presented a similar statement. After considering the subject carefully this committee unanimously voted that it disapproved the bill. Information as to this vote has been presented to the judiciary committee of the House, which has had the matter under consideration.

The committee report was unanimously adopted by the association.

Another Utility Sheet Appears

Another property which wants the good will and co-operation idea fostered is the Interstate Public Service Company, Indianapolis, Ind., publishers of a new sheet called *The Interstate News*. The pamphlet will be issued monthly and according to Harry Reid, president of the Interstate Company, its columns will keep the public informed of the railway's doings and its plans for future operation. The première of this paper outlines a plan of the company for the sales contest on the prior lien stock.

Louisville Grant Fails

Steps will be taken at once by the Louisville (Ky.) Railway to protect the company's property in the courts. Announcement to this effect was made by James P. Barnes, president, following the failure of the lower board of the General Council to pass the Mayor's fare ordinance, which came up for consideration during the week ended Aug. 12.

No legal action is contemplated until the fall term of the Federal Court, Mr. Barnes said, but attorneys have been instructed to proceed at once to obtain protection for the company's property.

It was reported that the company would give the General Council a limited time in which to pass the ordinance since it had been voted down by the lower board, as the board of aldermen was known to favor it, but Mr. Barnes stated that such was not the case. A statement by the company says:

> We have met the suggestions of the Mayor and city attorney in an earnest effort to arrive at a compromise that would end the litigation expensive to both sides and at the same time protect the interest of the public and our stockholders.
>
> In that spirit we agreed to accept a rate of return for the company which was less than we believed the investors were entitled to, and less than the courts would give an investor on the review of the evidence.
>
> I have no criticism to make of the acts of any city official, but as there has been a delay of several months, I have, in order to protect the interest of the company, instructed our legal department to proceed as rapidly as possible in the courts to obtain the full measure of protection under the Federal constitution for the company's property.

Interurban Wage Scale Renewed for Another Year

Continuation of the present wags scale for another year after Aug. 15 was provided in an agreement reached on Aug. 10 at Springfield, Ohio, between the Indiana, Columbus & Eastern Traction Company and its trainmen. The agreement affects all platform men employed by the line, as well as those employed on the Columbus, Newark & Zanesville Railway.

With one exception, the working conditions are to be unchanged. The exception, proposed by the men and readily accepted by the company, provides further recognition of seniority rights by permitting those longest in the service of the company to choose temporary runs of thirty days or more instead of regularly scheduled runs, if they so desire.

The wage scale agreement continues the rates which were decided by the arbitration board appointed last March to compromise the differences between the men and the company which existed at that time.

The scale for interurban motormen and conductors is 36 cents an hour for the first three months, 41 cents for the succeeding nine months and 47 cents an hour thereafter. Freight brakemen receive 34 cents an hour.

Conductors and motormen on the city lines operated by the companies at Lima, Newark and Zanesville receive 34, 39 and 44 cents on the same basis. Practically all of the men have been employed by the company for a period of more than a year.

The negotiations were marked by an unusually friendly atmosphere. The men first suggested a maximum of 51 cents an hour, but after Receiver J. H. McClure explained the difficult conditions facing the company the men agreed to continue the present scale for another year.

Normal Conditions Restored

Formal Wage Agreement Now Being Drafted Between Men and Management at Chicago

With the close of the strike and the resumption of service on surface and elevated lines in Chicago on the evening of Aug. 6, the only reminder of the six-day tie-up is a few 5-cent fare buses started by the city administration. At the height of the strike this competitive system was said to have included twenty-one buses. After a week it had dwindled to three vehicles, the rest having been abandoned as being unprofitable. It is said to be the intention of Mayor Thompson to keep these three in the field until November, when he hopes to have the voters approve his plan for investing $3,000,000 of the traction fund in a greater number of vehicles.

For a few days after the close of the strike it is said both companies experienced a small reduction in traffic, due to the fact that some persons were still using the commutation tickets purchased from steam roads. Business was said to be normal by the end of the first week of restored service.

The drafting of a formal contract for the new wage scale had not been concluded between surface car trainmen and the management up to Aug. 15, but no difficulty is expected over this because the only change will be in the new wage rates and the inclusion of a thirty days' cancellation clause to be used in the event that the rate of fare is disturbed by the Illinois Commerce Commission.

The new wage scale will be 65, 68 and 70 cents for the first three months, next nine months and after-one-year periods, respectively. The rate on night cars will be 72 cents. The contract will date from Aug. 7 and continue for one year. Practically all other employees will have their pay reduced on the same basis of 10 cents an hour.

Recreation Club Formed.—The Employees' Recreation Club of the Little Rock Railway & Electric Company, has been formed at Little Rock, Ark., with 131 pledged members. A tract of land near Little Rock has been purchased by officers of the company to be leased to the club. It is planned to erect bath houses, enlarge a bathing pool and to make other improvements to equip the place for swimming, fishing, hunting and other outings.

Indiana Cities to Seek Amendments to Commission Law

An organization of cities of Indiana to oppose increases in utility rates and to bring about legislation, particularly amendments to the public service commission law, was agreed on by mayors and city attorneys of several Indiana cities at a meeting held recently at the invitation of Mayor John C. Quick, Muncie, Ind.

Mayor R. O. Johnson, of Gary, argued that the law should be repealed and rate-making and control of utility corporations should be returned to city councils. Most of the city attorneys present, it was said afterward, opposed repeal of the basic law, but urged the need of amendments designed to open the way to a stronger presentation of the "case of the people" than under the present operation of the law. Cities represented at the meeting were South Bend, Hammond, Gary, Anderson, Newcastle, Elwood, Crawfordsville, Vincennes, Indianapolis, Muncie, Whiting and East Chicago.

It will be recalled that last Spring Mayor Lew Shank of Indianapolis declared that he intended seeing to it that some change was made in the law or the entire commission done away with.

Indiana Association Aroused to Action on Threatened Utility Legislation

A letter urging support of the principle of state regulation of utilities has been sent by the Indiana Public Utility Association to the 50,000 residents of Indiana who own securities of public utilities of the State. Charles L. Henry, president of the association, has issued a statement in the course of which he says in part:

> We are making this appeal for two reasons: We believe that future stability of the industry depends on continued regulation by the State, and we feel that the safety of investments made by Indiana people depends on regulation. Thousands of Indiana men and women have lent money to the utility industry because, under State regulation, they felt sure the industry would be permitted to earn a sufficient return to pay them reasonable interest for their money.

This action indicates that the association is now preparing to prevent radical changes in the utility laws of Indiana threatened to be made at the next session of the General Assembly. Those opposing the Public Service Commission, including Mayor Lew Shank of Indianapolis, and other city officials, are busy with their side of the campaign.

Mayor Lew Shank has already named a special committee which will recommend changes in the public utility law of Indiana. The Mayor never has wholly given up his idea of having the entire law repealed if it can be done, but the committee will meet early in September and will continue in session until some definite recommendations are ready to be submitted with reference to the present law. The state Legislature convenes in January.

New Incorporation in Prospect

After reaching a conclusion that there were too many disadvantages in an electric motor bus line, such as they had considered tentatively as a means of transportation between Fort Mitchell and Erlanger, Ky., citizens of the latter village recently decided to build a traction line instead. It is the intention of those behind the project to build tracks and erect the overhead wires from Mitchell to Erlanger and then lease the tracks to the South Covington & Cincinnati Street Railway, Cincinnati, Ohio, which will extend its Fort Mitchell line to Erlanger.

The 3¼ miles of traction line will be built by the Fort Mitchell, Erlanger & Elsmere Traction Company, which is to be incorporated for $75,000. Paul Hesser, Erlanger, has been elected president of the company. Other officers are: Judge H. F. Childress, vice-president, and Chester C. Davis, secretary and treasurer. These three men with George Rost and Attorney David C. Castleman, Covington, Ky., will constitute the board of directors.

Before selecting the traction line as the better means of transportation, those who are promoting the company said that they obtained assurance from the South Covington & Cincinnati Street Railway that the electric cars operating to Fort Mitchell would be extended to Erlanger, if the tracks were built and leased to the company at a reasonable figure. The proposition has not gone as far as a written agreement, but the citizens interested feel that they are justified in going ahead with the organization of the company.

As the Dixie Highway does not follow a straight line into Erlanger, the tracks will be laid on a private right-of-way. In some places it will be near the highway, but in others as far as a half mile or more away. It is estimated that about 3¼ miles of track will be needed to put in the extension.

Finishing Touches Being Put on New Orleans Ordinances

Paul Maloney, commissioner of the Department of Public Utilities, has introduced three ordinances in the Commission Council of New Orleans which, if adopted, will reduce fares in New Orleans to 7 cents and make the basic gas rate $1.30 per 1,000 cu.ft. from Sept. 10. The New Orleans Public Service Corporation, the successor under the reorganization to the New Orleans Railway & Light Company, will have three months to accept the conditions named in the new ordinances. These ordinances went over for adoption from Aug. 8 until Aug. 15 under the rules.

It is understood—and Commissioner Maloney has so expressed himself—that with the adoption of the ordinances on Aug. 15 the new corporation would go into court on Aug. 17 and take over the various subsidiary organizations controlled by the New Orleans Railway & Light Company. This action will now be delayed, however, on account of developments in connection with the foreclosure sale noted on page 275.

The first of the three ordinances provides that the city shall have a perpetual option on all property of the original company up to $11,048,000 plus or minus an amount equal to the additions to or deductions from the rate base made to the electrical system subsequent to Dec. 31, 1920.

The second ordinance covers the subsidiaries, and includes an option of $25,000,000 worth of property, under the same terms.

The third ordinance gives an indeterminate permit to the New Orleans Gas Company to operate in the city and gives the city an option over all the property.

Praises Advertising Delegation

Ad club members of Pine Bluff, Ark., met recently to show their appreciation of the advertising Pine Bluff received at the convention of the Associated Advertising Clubs at Milwaukee. In the absence of B. W. Benton, president, J. L. Longino, manager of The Pine Bluff Company, presided. He praised the endeavors of the Pine Bluff delegation and announced the purposes of the meeting. The speakers announced that Pine Bluff was ready to take care of any increased population or additional industries which might result from the advertising which the city received.

News Notes

Wages Cut.—A new wage scale affecting the employees of the Stark Electric Railway, Alliance, Ohio, was put into effect on May 1 and will terminate on May 1, 1923. The new schedule is a cut of 5 cents an hour, the maximum pay being 50 cents and the minimum 45 cents for the interurban men with 47 and 42 cents for city men.

No Change Contemplated.—No change in the superintendency of the Seattle Municipal Railway is contemplated by the present city administration, D. W. Henderson continuing as general superintendent of the railways. George F. Russell, new superintendent of public utilities, states that Mr. Henderson's powers are to be concentrated, not diminished.

Franchise Transfer Authorized.—Permission has been granted the Cincinnati, Newport & Covington Railway to assign its franchise to operate within the city of Cincinnati, Ohio, to the South Covington & Cincinnati Street Railway. The ordinance granting the transfer was favorably recommended by the committee on street railroads. The transfer will be made as a refinancing measure.

Service Temporarily Suspended.—As a result of a strike by the power plant employees of the Boston & Maine Railroad at Franklin the Concord (N. H.) Street Railway had to suspend service for a day or two. The railway is dependent on the plant for power. Service was resumed, however, power being supplied from plants at Newport, in Concord and on the Merrimack River at Gavin's Falls.

Agreement Renewed on Engineers' Wages.—The Cincinnati Traction Company and the Stationary Engineers' Union have reached an agreement, whereby the scale now in effect will be continued another year. The engineers took a considerable reduction a year ago following a strike. The stationary firemen and oilers, who had an arbitration award a year ago, are awaiting another decision to be rendered as soon as the State Industrial Commission appoints a neutral chairman.

Paving Ruling Stirs Kokomo.—The case of the petition of the Indianapolis (Ind.) Street Railway before the Public Service Commission which provided that the company should not be made to pave between its tracks in Indianapolis and which was decided in favor of the company may be made a precedent for the entire state of Indiana. Steps now are being taken in Kokomo to get through an ordinance which will specifically specify that the Indiana Railways & Light Company there be compelled to pave between its tracks and that the case be carried to the Supreme Court of the State.

Reports Against Trial Bill.—The Senate committee on corporations of the General Assembly of Louisiana, now in session at Baton Rouge, has unanimously reported adversely the bill recently introduced, at the request of the street car men of New Orleans, to provide trial of all employees of public service corporations before dismissal on charges. The Car Men's Union was represented by James Keenan, its president, and Gus Heintz, member of the executive committee; Receiver J. D. O'Keefe of the New Orleans Railway & Light Company and Abe Goldberg, attorney, appeared for the railways.

New City Plan for Worcester.—Publication in full has been made of the text of the city plan for Worcester, Mass., which has been in preparation since 1915 under the direction of the City Planning Board and a group of New York experts. It is said that through the report the city has discovered that it can save the equivalent of $6,500 a day every day in the year by improving street facilities and traffic methods in a way to make them adequate to the amount of traffic carried. All the usual provisions of city plans are included, such as coordination of street cars, trackless trolleys, motor buses and steam roads; relocation of freight yards and tracks so as not to impede the proper expansion of business or residential districts; amplification of sewage and water supply systems.

Financial and Corporate

Car Trusts Sold

$4,864,359 Represents Amount of Depreciated Value of Equipment Secured by P. R. T.

Dillon, Read & Company, New York, N. Y., offered for subscription an issue of $2,150,000 Philadelphia (Pa.) Rapid Transit Company's 6 per cent equipment trust certificates. They were offered at prices to yield from 5 to 6 per cent, according to maturity, and are due in equal semi-annual instalments from Feb. 15, 1923, to Aug. 15, 1932. The certificates are issued by the trustee against standard street railway equipment, comprising 600 cars, with a present depreciated value appraised by the builders at $4,864,359. The issue was oversubscribed by a large amount.

The offering was significant for several reasons. First, the amount involved was large for an issue of this kind. Second, the interest rates were well within the limits which money loaned for similar purposes has commanded recently, thus reflecting the good credit standing of the company. Third, it is said that this was the first instance in recent years if not in the history of the company that financing has been done by the company through other than the Drexel or allied interests in Philadelphia.

The floating of the certificates is said to have followed directly a conference between members of the United States Shipping Board and Thomas E. Mitten, president of the company, in Washington. The greater part of the funds from the trust certificates will be used to purchase 100 large yellow Hog Island cars (out of a total of 210), power equipment, track and other facilities, from the Government. The Philadelphia Rapid Transit Company has had the cars and equipment under lease from the Government since their construction in 1918.

According to the company statement, "Series F" will cover 500 near-side or center-exit cars and all or part of the 210 Government cars furnished during the war. All of the 710 cars are now in operation on the lines of the P. R. T.

Five hundred thousand dollars will be spent to retire equipment trust certificates now outstanding against the 500 near-side or center-exit cars; $1,200,000 will be used for the purchase of the Government cars and equipment, and $450,000 will be held available for further improvements and additions to property.

Six hundred standard steel cars, part of which were constructed in 1913 and part in 1918, constitute the equipment which was pledged for the issue. As stated previously, it is estimated that the depreciated value of the cars is $4,684,359, or more than double the amount of the certificates.

To what extent the additional $450,000 from the series "F" fund will be used "for further improvements and additions to property" was not made known. At present it will be held in reserve pending the development of future plans, it was declared.

Power Project Taken Over by Graham Interests

The property and franchise of the Washington County Light & Power Company were sold at Machias, Me., on Aug. 7 by Receiver Irving E. Vernon, Portland. They were purchased by Edward M. Graham, president of the Bangor Railway & Electric Company.

The Washington County Light & Power Company was chartered by the Legislature about four years ago. The company purchased the lighting company doing business at Machias. It began its development at Columbia and had a dam at the place about 75 per cent completed when financial difficulties were encountered and early in the present year a receiver was appointed.

With the Bangor Railway & Electric Company, the Union River Light & Power Company at Ellsworth and the Washington County Light & Power Company practically under one management, President Graham by his purchase became identified with a lighting and power system which will eventually extend from Lincoln to Eastport, a distance of practically 200 miles.

Bondholders Buy Ohio Electric for $2,000,000

Bondholders of the Ohio Electric Railway, Springfield, Ohio, represented by Thomas Newhall, Philadelphia, bid in at the upset price of $2,000,000 the property of the company, consisting of the interurban line between Lima and Toledo, power and heating plants at Lima and the city street railway system there, at the special masters' sale at Toledo, on Aug. 15. Mortgages totaling $4,200,000 were foreclosed recently and the property ordered sold by the Federal court.

B. J. Jones, receiver, who was made special master to conduct the sale, said that operation of the line would not be interfered with by the sale. City commissioners of Lima and representatives of the street railway and power interests have agreed upon new franchises there. It is expected that those local properties will be grouped under separate management.

It was agreed to put $200,000 of new capital into improvements on the Lima properties.

Reorganization of the Ohio Electric interurban property will probably follow the confirmation of the sale by Judge John M. Killits at Toledo.

Sale of Property Delayed

City Attorney Charges Sale of New Orleans Road Should Have Been Advertised Fifteen Days

City Attorney Ivy Kittredge has called a halt in the proposed public sale of the New Orleans Railway & Light Company, New Orleans, La., which was advertised to come off Aug. 17. In an opinion to the members of the Commission Council, made public on Aug. 13, the city attorney holds that, under Section 28 of the city charter, which has not been repealed and which is not affected by the indeterminate act of the Constitution of 1921, it is specially provided that every ordinance mentioned in the charter granting use of a public street, whether for pay or not, must be advertised fifteen days before the City Council can adopt it.

When the question was raised regarding the legal features of the proposed sale under authority of the indeterminate permit accorded the City Council, without having previously advertised the permit to do so, for fifteen days, as required by the city charter, counsel for the company, H. Generes Dufour, held that the matter came under Act 94 of the Constitution of 1921 and could not affect the legality of the proceedings or sale.

The city attorney to whom the matter was referred by the Commission Council now declares that the indeterminate act, alluded to, specifies no details or forms, delays or advertisements that the Council must pursue and hence to conduct the sale, in strict accordance with law, the permit must be advertised for fifteen days.

C. C. Chappelle, representing the eastern stockholders, who attended the conference held between the members of the Commission Council and the representatives of the railway company, was for proceeding with the consummation of the sale, in strict accordance with law, although he was anxious to hasten matters. If the city attorney was of opinion that the permit should be advertised, he (Chappelle) would offer no objection, although the conference was undecided whether such further advertising was necessary.

Commissioner of Finance Murphy in expressing his pleasure over the result of City Attorney Kittredge's counsel, said he was just as anxious to have the matter cleared up legally as he was to have it disposed of quickly, and did not apprehend that more delay would affect the reorganization of the company.

Commissioner Maloney of the Department of Public Utilities, while declaring that he did not agree with the legality of the opinion of the City Attorney, thought the city attorney was acting for the best interests of the city and that he therefore would vote to advertise the permit.

The ordinance was to have come up for adoption on Aug. 15. This hiatus will of course not only delay the sale of the property but will postpone the contemplated reductions of both street car fares and the gas rate.

Receiver Appointed for Ogdensburg Street Railway

The Ogdensburg (N. Y.) Street Railway was placed in the hands of a receiver on Aug. 12 following an action commenced before Justice John C. Cropsey in Supreme Court by trustees named in the mortgage given by the railway to secure the payment of $150,000, together with interest amounting to $125,000. James E. Kelly, president of the St. Lawrence County Savings Bank, Ogdensburg, was named receiver. A large amount of the company's indebtedness is to the city of Ogdensburg, statements indicated.

Another Dividend Re-established

The United Railways & Electric Company, Baltimore, Md., has declared a quarterly dividend of 50 cents a share on the common stock payable on Aug. 15 to stock of record Aug. 3. This is the first dividend on the issue since January, 1919, when a quarterly distribution of the same amount was made.

Will Petition for Removal

The Northern Ohio Traction & Light Company, Akron, Ohio, will seek permission of the State Public Utilities Commission for authority to remove its railway system in Massillon. An announcement to this effect was recently made by General Manager A. C. Blinn to the Massillon City Council. City officials have been told by General Manager Blinn that the company is losing $25,000 a year on this city line. The company also objects to an estimated assessment, said to be large, as its share of the paving of two streets in Massillon. The company plans to build an interurban line to connect with the Massillon-Dover line. This interurban, the company claims, can be built for less than it will have to pay for the street improvements.

Subsidiaries Make Claims of $749,274

An order issued in United States District Court directs the receivers of the Pittsburgh (Pa.) Railways to show cause why they should not pay claims amounting to $749,274 made in behalf of two subsidiary companies. Six petitions were filed separately on behalf of each company but all concern rentals of leased property which the Pittsburgh Railways had contracted to pay.

The rentals were paid by the Philadelphia Company, which had guaranteed to pay all such claims in case the Pittsburgh Railways was unable to meet the payments. The petitions assert that the subsidiary companies must receive the money from the Pittsburgh Railways to discharge the indebtedness to the Philadelphia Company that they have thus incurred.

The petitions are: The Consolidated Traction Company for $473,100, $24,100 and $84,600 and the United Traction Company for $15,200, $1,974 and $150,300. The obligations were incurred by the Pittsburgh Railways Company by agreements made when mergers were effected with the subsidiary lines.

Reorganization Being Arranged

Final arrangements are rapidly being made for completing the reorganization of the South Carolina Light, Power & Railways Company, Spartanburg, S. C. As noted in the *Electric Railway Journal* for Aug. 5, page 211, the entire property of the company was purchased at receiver's sale on July 31 for $1,000,000 by the representatives of the bondholders.

It is proposed to transfer the property as a going concern to the South Carolina Gas & Electric Company. The new company will be capitalized as follows: $1,000,000 of 6 per cent preferred stock is to be issued, $2,000,000 of authorized 7 per cent prior preferred, 12,500 shares of no par common, $3,497,000 of first mortgage 6 per cent bonds and $650,000 of 6 per cent general mortgage bonds. The former outstanding issue of $3,497,000 of first mortgage 5s and the $176,000 of secured bank loans will be paid or refunded by new first mortgage 6s to a similar amount, and the $650,000 of 7 per cent 5-year notes will be paid or refunded with the 6 per cent bonds.

The unpaid interest and the unsecured claims will be paid or refunded by scrip. Holders of preferred stock in the old company will receive share for share preferred stock as the new company and present holders of common will receive one-half share of new no par value common for each share of old. The new prior preferred stock will be held in the treasury subject to conversion therein of the 6 per cent general mortgage bonds at 90 per cent.

For more than a year now the company has been operating under conditions which have constantly been growing better. Rates have been advanced and as no interest has been paid for some time now on the funded obligations, a cash balance has accumulated which will be used for improvements.

Earnings of the company under the new rates are said to show a very satisfactory ratio above fixed charges imposed by the new capitalization.

Redemption and Conversion Notice Announced

The Toledo Traction, Light & Power Company, Toledo, Ohio, has announced that on Sept. 1 it will make payment on its first lien 7 per cent gold bonds dated Sept. 1, 1921. The holders of these bonds will be paid the principal together with a premium of ½ per cent of such principal and interest accruing to Sept. 1, 1922.

It was also announced that the privilege of converting and exchanging these first lien 7 per cent gold bonds into Cities Service Company Series D 7 per cent convertible gold debentures will expire on Sept. 1, 1922.

Financial News Notes

Land Sold.—The Detroit (Mich.) United Railway has sold a 12-acre piece in the Grand River section of the city. The sale price is said to have been $350,000.

Net Income of $602,272.—The Market Street Railway, San Francisco, Cal., for the six months ended June 30, 1922, reports a railway operating revenue of $4,675,810 and expenses totaling $3,421,877. The net income is $602,272, which includes no provision for Federal income tax sinking fund or betterments.

Railway Included in Merger. — The property of the Water, Light & Transit Company, Carrollton, Mo., was included in the deal under which the properties of the Kansas City Light & Power Company and the Carrollton County Power & Light Company were brought together in consolidation. Only 2 miles of electric railway are included.

Buys Railway Property.—B. F. Loos of Minneapolis has bought the property owned and controlled by the Iron River, Strambaugh & Crystal Falls Street Railway, Iron River, Mich., for $109,797 based on appraisal by the Rau Appraisal Company of Milwaukee. The property includes ten street cars, repair houses, station houses, equipment and trackage.

Net Income of $3,000,000.—Total operating revenue of the Brooklyn (N. Y.) Rapid Transit Company for the year ended June 30, 1922, was $34,544,093 against $30,972,085 for the previous year. Operating expenses decreased from $26,425,704 to $22,040,554 for the period ending June 30 of this year. The net income for this year's period was $3,087,419 against a deficit a year ago of $4,880,934.

Stock Issue Approved.—The Board of Public Utility Commissioners of New Jersey has granted approval to the application of the Morris County Traction Company operating in Morris County, to issue $1,600,000 mortgage bonds; $1,500,000 par value of its preferred stock and $1,179,000 common stock. The issuance of the additional capital stock is to make extension to the company's property.

Gold Certificates Sold.—The Cincinnati (Ohio) Traction Company has sold an issue of $725,000 of 6 per cent equipment trust gold certificates to Halsey, Stuart & Company, Chicago, Ill. The proceeds of the sale are to finance the purchase of seventy-five new double-truck cars, which have been ordered by the company and which will be built at the plant of the Cincinnati Car Company. These cars will be ready for operation late in the fall and will supplant the present single-truck cars.

Traffic and Transportation

Safety Responsibility Partly in Hands of Public

An important decision has been handed down by the Massachusetts Department of Public Utilities relative to the warnings that the Boston & Worcester Street Railway shall be required to give the public in the town of Shrewsbury. The selectmen of Shrewsbury sought to enforce certain old franchise requirements regarding signals, and in addition to this they wanted automatic swinging arm or flashlight signals, similar to those recently installed on some of the railroad crossings in Massachusetts. In its decision the Department of Public Utilities lays down the principle that the travelling public must assume some of the responsibility for safety at crossings. It declares bell signals that were practical before the days of the automobile horns to be less useful at the present time. The commission says:

The commission has given much consideration to requiring the company to make a full stop before proceeding over the crossing. The grade on the railway at some of these crossings is so steep that it would seriously interfere with the operation of freight cars, as well as slow up the schedule of passenger cars, to make a full stop at all of the crossings. Furthermore, if cars stop at some crossings in one direction and not in the other, it is apt to mislead travelers on the highways.

After consideration of all the facts and circumstances in the case, including the duty of travelers upon the highway to exercise due care and not throw the whole burden upon the street railway, we are of the opinion that reasonably adequate protection would be afforded the traveling public on these highways if, in addition to the maintenance of the signs now installed, all cars sounded their whistles 500 feet from the crossing and again at 250 feet and reduced their speed over the same to 5 miles per hour.

It is therefore

Ordered. That the Boston & Worcester Street Railway Company in the operation of its cars over the crossings known as Fruit Street, South Street, Grafton Street, Lake Street and Turnpike, in the town of Shrewsbury, in addition to the maintenance of signs as now installed, sound a whistle five hundred (500) feet and again at two hundred fifty (250) feet from each crossing and reduce the speed of its cars to five (5) miles an hour over the same.

Bus Lines Purchased to Improve Service

The Puget Sound Electric Railway, Tacoma, Wash., in an effort to improve its service to the travelling public, has purchased the auto bus lines between Tacoma and Olympia, 32 miles, from Thompson-Smith interests. The deal approximates a consideration of $150,000. According to A. W. Leonard, president of the company, the bus lines were purchased to provide better connections for the travelers from Seattle to Olympia, and better service from Tacoma to Olympia. The company will not extend its transportation beyond Olympia, Mr. Leonard states, and the report that the bus lines from Olympia to Aberdeen have been purchased is untrue, he further advises. "We are in the transportation business, and this extension is not an effort on our part to effect a monopoly, but solely in the interest of better transportation," said Mr. Leonard.

Railway and Stage Lines Join in Protest

Protests against the new time schedule filed recently by H. E. Knowles, operating jitney buses between Seattle and Bryn Mawr and Seattle and Rose Street, under his Seattle-Renton certificate, have been filed with the street department of public utilities at Olympia by the Seattle & Rainier Valley Railway and the Seattle-Renton stage lines. The railway protests that the time schedule shows an operation entirely within the city limits, between Seattle and Graham Street; that the railway service is adequate, that Knowles is operating without proper authority from the state, and that the department has no authority to permit the filing of a time schedule for strictly city operation. The stage lines' protest is based on the claim that Knowles is not a good faith operator, and has no right on the run. Knowles in his time schedule proposes one round trip per day between Seattle and Renton, forty-three extra trips between Seattle and Bryn Mawr, and fifty extra trips between Seattle and Rose Street. Hearing will be held in Olympia.

Wants Motorists' Help for Safety Campaign

The United Traction Company, Albany, N. Y., recently started a campaign for the prevention of accidents. H. B. Weatherwax, vice-president of the company, has sought the aid of owners of pleasure cars and commercial vehicles in the territory covered by the traction company in a letter requesting co-operation and offering ten suggestions for safe operation on routes traversed by the electric railway cars. The letter says in conclusion:

You will be safeguarding your own interests and be of material assistance to us by observing the following precautions:

1. Make sure trolley car is not coming when starting out from curb, and give proper warning before starting if car should be near.
2. Do not trail the trolley car too closely.
3. Cross crossings cautiously.
4. Be watchful of trolley car making curve so as not to be hit by swing of rear end.
5. Avoid parking cars near trolley curves in narrow streets so as not to be caught "in the pinch."
6. Avoid speeding to get ahead of trolley when other cars are parked at the curb.
7. Avoid crossing in rear of trolley car, other cars, unseen, may be coming in the opposite direction.
8. To get ahead of trolley car, make sure it is well to the rear before cutting in front.
9. Observe law and do not pass trolley while taking on or discharging passengers.
10. When parking at curb in narrow streets, be sure there is plenty of room for trolley to pass.

Safety First.

Case Before Special Master Being Concluded

Taking of testimony in behalf of the State in the 10-cent fare hearing before Special Master Haight was concluded on July 25 and the presentation of rebuttal evidence for the Public Service Railway was begun on Aug. 7. Summing up of the opposing attorneys and the submission of briefs will complete the case.

By consent of counsel, the special master agreed to have introduced as evidence, without reading, copies of municipal ordinances bearing on the operation of street railways. The special master also agreed that Mr. Petty and General Auditor M. R. Boylan of the Public Service join in correcting some minor errors in figures in the various tables submitted.

Tabulations made by the commission pointed to a heavy loss in revenue-producing passengers alleged to be due to the 8-cent fare. Figures submitted gave the number of passengers carried under the 8-cent fare as 394,858,000, while estimates of the number which would have likely been carried under the 8-cent fare fixed by the commission and suspended by the court increased this number to 416,605,000, a loss under the present fare of 21,747,000. Figures were introduced purporting to indicate that the increase in jitney passengers showed that a majority of this loss had gone to the jitneys.

While there was a loss in the number of passengers carried under the increased fare, the total operating income was slightly higher than it would have been under the 7-cent fare. The additional sum, however, was held by the commission to be insufficient to warrant the efforts made to secure the higher fare. The income under the 8-cent fare was given at $6,321,691, while the estimated revenue under the 7-cent fare was given at $6,018,778.

Figures submitted showed that the actual net income of the company was $269,000 in excess of the estimate, or approximately $6,740,000 on something over a 7 per cent return on the valuation fixed by the commission on the company's property.

An attack was made on the amount set aside by the Public Service for claims, it being asserted that the sum was in excess of that necessary.

Second One-Man Car in Operation

The Olean, Bradford & Salamanca Railroad recently put its second one-man car in operation in Bradford, Pa. Several months ago the first one-man car was put into service and proved a success. General Manager Wheeler announces that this service will be extended to the cities of Olean and Salamanca. The company has presented a new fare schedule to the Public Service Commission, which will cut fares between inter-stop points in Bradford about 10 per cent, while terminal tickets will be reduced to the level of steam railroad prices.

Interchangeable Transfer System Recommended

In December, 1921, the California State Railroad Commission recommended an increase in the fare on the Pacific Electric Railway lines, effective on Jan. 1, 1922, and urged that each individual city served by the company should confer with the commission's engineers and representatives of the railway to adjust the matter of local fares, service and jitney bus competition. These conferences as regards the city of Pasadena have been concluded and on July 26 a report was presented by the two consulting engineers representing the city, Franklin D. Howell and T. D. Allin, who had studied the subject with F. E. Geibel, special engineer of the Pacific Electric Lines. The report recommended that the local car service should be retained. Pasadena has a population of over 40,000 and a local street car mileage of 40.9 equivalent single track. For several years there has been considerable jitney bus competition.

On this point, after recommending certain changes in railway trackage and bus routes so as to reduce this competition, the engineers declare definitely that all bus and rail lines should issue transfers, one to the other, whether operated by the same or different companies and that a responsible company only should operate city buses. In general the buses should give the cross-town traffic.

Considerable space is given in the report to the paving charge and to the expense to the railway company of abandoning first class track on account of city requirements before the life of the track had run. On this point the report says:

> The track once laid should be allowed to be maintained until at least 80 per cent of its usefulness has been realized; girder rail construction should not be required except on such streets as are through, main arteries of general travel; paving should be eliminated from railway investments or expense, except so far as the railway company cuts paving for purposes of construction or repair, in which cases it should replace the cut portions only.

In short, the engineers recommend that all possible expense not directly contributing to railway operation be eliminated as a means of reducing the excessive costs mentioned.

Opposes Fare Reduction in Kansas City

Francis M. Wilson, receiver of the Kansas City (Mo.) Railways, recently commented on the agitation for fare reductions and the talk about new wage schedules. In answer to the demands contained in the 5-cent fare resolution proposed by the Central Labor union of Kansas City, he said that a return to a 5-cent fare would bring about a reduction in trainmen's wages from 53 cents an hour to 33 cents. Further that the receipts of the company would decrease $3,300,000 a year, which would destroy the receivership and defeat the end for which it was established. Besides this, service would have to be curtailed and the abandonment of several lines would follow.

He said that he would indorse any movement having for its end a reduction in fare provided this could be done without serious consequences to the riding public. In his opinion no fare reduction could be effected until wages were reduced and he said that he would never agree to a reduction in wages "of efficient and courteous employees until economic conditions justify the decrease."

Transportation News Notes

Consideration for Summer Passengers.—According to a recent order of the South Carolina Railroad Commission the Augusta-Aiken Railway & Electric Corporation must provide ice water on its cars from March 1 to Oct. 1.

Pass Meeting With Success.—Officials of the Tacoma Railway & Power Company, Tacoma, Wash., report that the success of the weekly pass system has been beyond expectations. The second week of the pass considerably exceeded the first week, when 7,004 passes were sold.

Increase Fares.—Increase in fares to a flat 6 cents from a rate of 5 cents for adults and 3 cents for children has been granted the Dayton & Troy Electric Railway by the Piqua City Council. As a result the railway has promised to install several additional cars, probably of the one-man type.

Will Seek Franchise Amendment.—It has been announced by C. G. Holland, president of the Danville Traction & Power Company, Danville, Va., that the company will ask the City Council for an amendment to the railway franchise which will permit the use of one-man cars on the system. The present franchise specifies that all cars shall be operated by two men.

Cars Marked to Assist Patrons.—In line with its consistent policy of bettering the service the Des Moines (Ia.) City Railway recently announced that all cars would be marked with a large number to assist the public in locating cars. Each line in the city has been assigned a number running from one to twenty-six and a sign bearing the number of the line will be displayed conspicuously on the front of the cars.

Jitneys Barred—By an order of Brigadier-General Moseley jitneys have been barred between Battle Creek and Camp Custer, as a result of the Michigan Railway having agreed to increase its car service between the city and the camp. All jitneys have been eliminated from the reservation with the exception of the jitney under control of the post exchange which will meet all cars at Twenty-first Street, Camp Custer.

Trackless Trolleys in Prospect.—Charles R. Barnes Railway Commissioner of Rochester, N. Y., with James F. Hamilton, president of the New York State Railways, has under consideration the establishment of three trackless trolley lines in Rochester. Definite announcement of the details of the plan together with the approximate date of starting the service will be given out shortly.

Service Suggestion Wins Prize.—The transportation department of the Los Angeles (Cal.) Railway each month is offering cash prizes for valuable service suggestions by employees. Seventy-eight suggestions were submitted during the month of May for the first awards. The first prize of $50 goes to Motorman Estes, who suggested that efforts be made to broadcast some ideas on street car service and safety by the radiophone.

Free Rides for Veterans.—From June 17 to June 25 confederate veterans and boy scouts in uniform were presented with special free tickets for transportation on cars of the Virginia Railway & Power Company, Richmond, Va. Granting this privilege for re-union week was the result of a letter to General Manager Harvell from W. M. Myers, director of public safety, who said that this plan would work to the satisfaction of the veterans.

Confer on Relieving San Antonio Railway.—The San Antonio (Tex.) Public Service Company is losing more than $25,000 a month from the competition of the jitneys. W. B. Tuttle, vice-president and general manager, has informed Mayor Black that the company cannot continue the present service in face of this loss; that some lines must be discontinued, and that service on others will have to be curtailed. It is estimated that more than 30 per cent of the city's transportation is now done by jitneys.

Will Indorse Certain Bus Projects.—John S. Bleecker, general manager of the Indiana, Columbus & Eastern Traction Company, Cincinnati, Ohio, recently assured representatives of the Springfield-Mechanicsburg Motor Bus Company that he was ready to do all in his power to encourage bus lines to towns not reached by the traction line. Facing the prospect of being forced out of business by the terms of the licensing and regulatory ordinance recently adopted by the Springfield City Commission the bus men called on Mr. Bleecker to enlist his co-operation.

Railroad Victor in Jitney Issue.—The Board of Public Utility Commissioners of New Jersey announced recently the dismissal of the application of the Weehawken township committee and a number of jitney bus owners for an order restraining the West Shore Railroad from excluding jitney buses from space heretofore occupied by them at the Weehawken ferry terminal. The board said it was without jurisdiction to decide the title and easement of the space occupied by the buses, and held that under a former court decision the railroad has the right to regulate the movement of buses on its property.

Legal Notes

CALIFORNIA — *Duties of Cars, Other Vehicles and Pedestrians on Street.*

In an action by a pedestrian for injuries received in a collision between a motor truck and a street car, instructions that a street car has the right of way on that portion of the street on which it can travel, and that if the driver of the motor truck was using due care, no negligence should be imputed to its owner, and that in operating its cars along its tracks the street car company was obliged to use ordinary care to avoid coming into contact with vehicles driven across the tracks, considered as a whole, were not erroneous as being misleading. [Armock et al. vs. United Railroads of San Francisco et al., 204 Pacific Rep. 856.]

FEDERAL COURTS—*Public Service Commissions — Action Reviewable by Federal Court Only on Constitutional Grounds—Valuations.*

The action of a public service commission in prescribing rates to be charged by a public utility corporation is reviewable by a federal court only on the question whether it is an invasion of constitutional rights and such collateral questions as are incidental thereto, and the presumption is in favor of its validity.

A franchise for a public utility is granted on the implied condition that it shall be used for the public benefit and at reasonable rates of charge to the public, and in the computation of the value of the property used in the service by a public service commission for the purpose of establishing reasonable rates, the value of the franchise should not be taken into consideration. In ascertaining the present value of physical property in a period of changing values, a decided tendency to higher or lower may be recognized and considered; failure to earn a fair return in past years is not a factor to be considered nor is the federal income tax allowable as an expense of the business. [Georgia Ry. & Power Co. vs. Railroad Commission, 278 Federal Rep. 242.]

FEDERAL COURTS—*A Court in Enjoining Statutory Rate, May Fix Conditional Rate.*

While a court of equity has no power to fix rates of fare to be charged by a street railway company, it may, when granting a preliminary injuction restraining as confiscatory a rate established by a state board, name a rate as a condition of the injunction, beyond which the company may not go pending final adjudication and the determination of a just rate by a proper body, with provision for refunding of any excess above the bond rate in case that rate is finally sustained. [Public Service Ry. Co. vs. Board of Public Utility Commissioners, 276 Federal Rep. 979.]

GEORGIA—*State Commission Orders Are Superior to City Ordinances.*

A city ordinance requiring street railway companies to divide cars into separate divisions for white and colored passengers and to designate the divisions by a sign or placard conflicts to some extent with a rule of the Railroad Commission requiring white passengers to be seated from the front of the car towards the rear, and colored passengers from the rear of the car towards the front, and requiring each seat to be filled to capacity before taking the next seat. Hence, the commission's order had superior and binding force and effect as a civil rule to the exclusion of the municipal ordinance. [Savannah Electric Co. vs. Lowe, 108 Southeastern Rep. 313.]

MASSACHUSETTS—*A Street Railway Company Is Not Required to Protect an Intending Passenger Against Pushing by Crowd While on the Public Highway.*

A street railway company was not negligent in failing to restrain a crowd waiting for a car, at a stopping place where there was no station or platform, and passengers boarded the car from a public street, and it was not liable for the injury to a child pushed under the side of car by the crowd, assuming that she was a passenger. [Savickas vs. Boston Elevated Railway, 132 Northeast. Rep. 29.]

NEW JERSEY—*The Order of a Public Service Commission Requiring a Public Utility to Set Apart a Depreciation Fund Held Not the Fixing of a Just and Reasonable Rate. Where an Order on Rates is Not Supported by Evidence, the Court May Set It Aside and Remand the Proceedings.*

An order made by the Board of Public Utility Commissioners requiring a public utility to set apart yearly a depreciation fund of a fixed amount, and its refusal of a sufficient rate for services rendered to produce the necessary income for that purpose, is not the fixing of a just and reasonable rate. The court has no power to fix the rate, but where a commission's order on rates is not supported by the evidence, the court has the power to set aside the order and remand the proceeding to the commissioners to fix a just and reasonable rate, based on the evidence. [Public Service Ry. Co. vs. Board of Public Utility Commissioners, 114 Atlantic Rep. 323.]

PENNSYLVANIA—*Public Service Commissions Have no Jurisdiction Over Lessor Companies Which Have Ceased to Function*

The Public Service Commission has no jurisdiction over a public service company which under legislative authority has leased its franchise and property to another corporation and has ceased to function, since it has no rates to make or collect, no service to render the public, and no facilities to furnish or extend. The commission is concerned only with the rendition of service by the operating company at reasonable rates, and it is immaterial if the operating company under its lease must pay an unreasonable rental to the lessor and is thereby prevented from earning a reasonable return. [Philadelphia City Passenger Ry. vs. Public Service Commission of Pennsylvania et al., Appeal of City of Philadelphia, 114 Atlantic Rep., 642.]

PENNSYLVANIA—*Financial Condition Held Not to Excuse Failure to Improve Streets. Commission's Consent Unnecessary to Minor Changes of Street Grade.*

A street railway company is not excused from performing its contract to reduce its tracks to a new grade and pave the tracks by its financial embarrassment and difficulty in procuring material and labor, where the municipality offered to permit the company to use the existing material, and the improvement was undertaken before our entrance into the World War. In such a case the municipality is not required to get the consent of the Public Service Commission provided the change in grade was but a few inches and so inconsequential. [Borough of Sayre vs. Waverly, Sayre & Athens Traction Co., 113 Atlantic Rep. 424.]

TEXAS—*Injury to Child Playing on Pile of Cross-ties Held Not Actionable.*

Where a seven year old child injured while at play on cross-ties, piled partly on a public sidewalk, did not climb onto the cross-ties from the sidewalk, but from the adjoining vacant lot, it was held that no legal duty rested on the defendant street railway company to pile its ties so as to make them a safe place to play on, and it was not liable for the injury. [Charles vs. El Paso Electric Railway, 234 Southwest. Rep. 695.]

SOUTH CAROLINA—*Agreement by a Street Railway to Pay a Portion of Flagman Expense Does Not Cover Gateman.*

The grant by a railroad to a street railway of permission to cross the right of way of the former is sufficient consideration for a contract whereby the street railway agreed to pay one-half the expense of maintaining a flagman, or lights at the crossing, if they were required by city ordinance, even though the railroad did not own the fee of the right of way. But this agreement does not require the street railway to pay one-half of the wages of a gateman who raised the gates on the approach and passing of trains and gave no signals to the street cars, which still had to be flagged by their conductors. [Southern Ry. Co. vs. South Carolina Light, Power & Rys., 112 Southeast. Rep. 75.]

Personal Mention

Charles W. Wilson Takes Up Superintendent's Work

Charles W. Wilson, recently promoted to superintendent of the lines of the New Jersey & Pennsylvania Traction Company, Trenton, N. J., has been identified with the street railway business for the past twenty-four years. A native of Philadelphia, he began work with the Philadelphia Rapid Transit Company as a conductor in 1898. A short time later he desired to work on the other end of the car and became a motorman. After working for that company for three years he became a conductor in the employ of the Philadelphia & West Chester Traction Company, remaining there for several years.

He at last returned to the Philadelphia Rapid Transit Company and ten years ago he went to Trenton, where he became identified with the New Jersey & Pennsylvania Traction Company. For nine years he was night dispatcher for that company, and one year ago was made day dispatcher, the position he held until his late appointment. He had also been acting as assistant to Superintendent Walter F. Tshudy for some time. The latter is now superintendent of the Philadelphia & West Chester Traction Company.

New Officers for Vincennes Railway

Under the reorganization of the Vincennes (Ind.) Electric Railway, Ewing R. Emison has been elected president, J. Hugh Powers vice-president and L. F. Gillett treasurer. Mr. Gillett was superintendent and purchasing agent during the period of reorganization. He is continuing his work as purchasing agent and in addition is also general manager. H. L. Bennett has been appointed secretary and auditor.

R. S. Persons Becomes President

Several changes have recently been made in the personnel of the Erie County Traction Corporation, Buffalo, N. Y. Richard S. Persons, who previously was secretary of the company, has been made president. W. J. Whuern is vice-president. Nathan A. Bundy, who was general manager, retains this position and acts also as treasurer. Fred Slade, formerly track foreman, is now engineer maintenance of way. The position of secretary is held by Harry P. Ward.

Mr. Morrison President at Corpus Christi

R. W. Morrison of San Antonio, who was influential in the organization of the Nueces Railway, which took over the railway property of the Corpus Christi Railway & Light Company, Corpus Christi, Tex., has been elected president of the company. A. C. Pruch, San Antonio, has been elected secretary, and E. H. Eldridge, Corpus Christi, treasurer and general manager.

A. J. Stratton Is Manager

Former Assistant Superintendent of Eastern Pennsylvania Railways Transfers to Southern New York Company

On July 1, just six months after A. J. Stratton was appointed assistant superintendent of the Eastern Pennsylvania Railways, Pottsville, Pa., he was made general superintendent of the Southern New York Power & Railway Corporation. By this rapid promotion, Mr. Stratton is placed in charge of the operation of more than 65 miles of track connecting Oneonta with ten outlying towns.

A. J. STRATTON

Mr. Stratton is a specialist on track construction. Since 1920 he has done engineering work for the J. G. White Management Corporation, and at the same time has carried on the work of superintendent of maintenance of way of the various lines associated with the Eastern Pennsylvania Railways.

Other positions which Mr. Stratton has held include that of engineer of the Mobile Light & Railroad Company, Mobile, Ala., and the Binghamton (N. Y.) Railway. From 1916 to 1918 he was assistant engineer of way and structures of the Brooklyn Rapid Transit Company, and from 1918 to 1920 he was assistant engineer of the valuation department of the Metropolitan Edison Company, Reading, Pa.

J. L. Adams, who has been vice-president and general manager of the Philadelphia & Western Railway, Norristown, Pa., has been elected president of that company.

F. Walker has been appointed purchasing agent and general freight agent of the Milwaukee Northern Railway, Cedarburg, Wis. This position was formerly held by Otto Maske.

C. E. Fahrney, general manager of the Ottumwa (Ia.) Railway & Light Company, has been elected a vice-president.

G. B. Darnell, formerly superintendent at Columbus of the Indiana, Columbus & Eastern Traction Company, Springfield, Ohio, is now roadway engineer.

C. L. Christopher is now engineer of maintenance of way, H. W. Wischmeyer engineer of power stations, C. O. Seaton engineer of overhead construction and John Zoll master mechanic of the Louisville (Ky.) Railway.

J. W. McNeeley, for many years associated with the Paducah (Ky.) Electric Company, is now superintendent. He was appointed superintendent of transportation in 1910. M. H. Hewett is purchasing agent.

A. C. Anderson has been appointed superintendent of railways of the Keokuk (Iowa) Electric Company. The position of claim agent is held by H. R. Miller, and that of engineer of overhead construction by G. W. Carlson.

Cyrus Corliss is engineer of construction of the Boston (Mass.) Elevated Railway, and J. J. Donahoe is chief engineer of the South Boston power station. Mr. Corliss has been construction engineer of the department of power.

C. G. Holland is now president of the Danville (Va.) Traction & Power Company, of which he was previously vice-president. J. F. Rison held the position of president and purchasing agent before Mr. Holland took over the work. J. I. Pritchett has been appointed vice-president.

Obituary

Mesheck Frost, who constructed the first street railway in Tiffin, Ohio, died on Aug. 6. In 1888 Mr. Frost was granted a franchise by the City Council which allowed him thirty-seven days to lay out the lines. In thirty-four days he had constructed and started operation on 2¼ miles of track. In 1892 Mr. Frost electrified the traction line. He later built another, known as the Highland line. For the past few years Mr. Frost had lived in New York City.

Walter G. Franz, consulting engineer of Cincinnati, Ohio, who had charge of the engineering work for the Dixie Terminal Building, the northern terminus of all cars of the South Covington & Cincinnati Street Railway, died of typhoid fever on Aug. 13 at Biddeford, Me. Mr. Franz was graduated from the University of Missouri and after practicing his profession in St. Louis went to Cincinnati in 1905. He had been prominently identified with the erection of some of the largest projects in Greater Cincinnati. For the past five years he was associated with William T. Fosdick, consulting engineer. Mr. Franz was forty-seven years old.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Coal Deadlock Broken

The agreement between the operators and miners of seven states at Cleveland this week breaks the deadlock and foreshadows the end of the strike for the present. It appears, however, that every issue involved in this strike must be fought out again. A truce now appears to be a certainty, but it will be a makeshift one.

The electric railway industry will be still concerned with the net effect of the strike. There has been a great industrial setback. There has been widespread unemployment. The nation's fuel bill for 1922 will be $300,000,000 more than it was in 1921. One-half of 1 per cent of the population has taken advantage of its position to dominate the supply of a necessity of life. The interests of 99.5 per cent of the population have been affected adversely. There has been no humbling of the organization responsible. No industrial disciplining has resulted. Nothing of permanent value to the public has come from the strike.

The Federal fuel committee is devoting its attention to spreading the limited coal supply over the various districts so as to avert possible shortage in the essential industries.

The U. S. Geological Survey has estimated that 765,000 tons of bituminous coal weekly will meet the immediate needs of gas and electric public utilities and domestic consumers in the territory east of the Mississippi River. Of this, New England would require 9.2 per cent; the non-coal-producing states of the coast region exclusive of New England, 21.6 per cent; coal-producing states of the coast region, 22.9 per cent, and Ohio, Indiana, Illinois and Michigan 46.3 per cent. Railroads in the same territory will require 2,000,000 tons weekly, making a total emergency requirement of 2,765,000 tons. The coal now produced in this territory is 3,800,000 tons weekly.

The railway mechanical situation on coal-carrying lines in the Virginias, which has been hampering the shipment of coal, continues to improve with the importation of mechanics from Eastern and Western lines. The requirements of the Chesapeake & Ohio and the Norfolk & Western systems are said to have been practically met, and mechanics are now being diverted to the Virginian Railway. Shipments of coal from southeastern Kentucky are being retarded to some extent by conditions at Corbin, Ky., where more than 300 railway mechanical employees are said to have left their employment because of threats of violence, but in the western Kentucky field coal production has been accelerated by a 100 per cent car supply.

The Department of Justice has rendered an opinion to the effect that priority orders for coal issued under Classification No. 1 of the Interstate Commerce Commission have preference over other orders which operators may have on their books.

A peculiar situation exists in the spot coal market. Prices are high but are not soaring, free coal is even more limited than a week ago, but the demand has declined apace with the amount of tonnage offering. The diminution of demand has been accomplished in many cases by the curtailment or complete shutdown of some industries which feel that this is preferable to paying the high premiums now secured by spot coal shippers.

Those who must keep in operation, and this class includes the railways and "essential" industries, are actively bidding for the meager current production that is available to the spot buyer. Priorities rule on the bulk of the tonnage moving but there is much confusion in carrying out these orders and railroad confiscations are heavy.

There is little of this spot coal available, for, although production is increasing, most of it is needed on priorities. Spot coal prices have risen to an average of $6.66 per net ton at the mines, *Coal Age* Index on Aug. 14 going to 550, as compared with 511 for the previous week. This is a rise of 39 points for the index and 48 cents in the average price for the week. The coal commission at Washington, recognizing usual expenses of certain operators now producing, has sanctioned an increase from the original $3.50 Hoover level to $4.50 for New River and $4.75 for Kanawha.

Railroads are functioning better, but the traffic congestion is still acute and lack of motive power is hampering dispatch of loads and the placement of empties. The roads are gradually enforcing the priority orders but State and Federal committees have not yet clamped the lid down on high prices.

Master Recommends Improvements on Pittsburgh Railways

Special Master Wasson in a report filed in the United States District Court has recommended that the receivers of the Pittsburgh (Pa.) Railways be authorized to spend $640,125 on improving the system. Among the important improvements will be the moving of the Jack's Run bridge which divides Pittsburgh from Bellevue. This moving will cost in the neighborhood of $20,000.

Other betterments recommended are:

Changes in the paint shop at the Homewood car barns. Estimated cost, $7,000.

Reconstructing double tracks in Wilkinsburg. Estimated cost $64,700.

Reconstructing tracks in Crafton at an estimated cost of $97,000.

Reconstructing tracks on Idlewood Avenue, Pittsburgh. Estimated cost, $15,600.

Reconstructing tracks on Main Street, Carnegie. Estimated cost, $70,000.

Reconstructing high tension lines and overhead feeders in Island Avenue, McKees Rocks; Stowe township, Neville township, Coraopolis and Moon townships. Estimated cost, $10,500.

Reconstructing tracks on Lincoln Avenue, Bellevue. Estimated cost, $77,600.

Reconstructing tracks on Grant Street at Second Avenue. Estimated cost, $6,000.

To install electric switch in Second Avenue at the junction of the Greenfield Avenue car line. Estimated cost, $300.

Reconstructing tracks on the approach to the Wilmerding viaduct. Estimated cost, $8,500.

To remove present tracks on Pacific Avenue, John Street and Windsor Street, McKeesport, and repave that part of the streets occupied by the tracks. Estimated cost, $5,000.

Reconstructing tracks on Third Avenue between Grant Street and Market Street. Estimated cost, $12,000.

Reconstructing tracks on Charles Street, Knoxville. Estimated cost, $40,000.

Reconstructing tracks, switches and frogs at the Riverview Passing siding on the Charleroi interurban division. Estimated cost, $3,500.

Constructing loop at the Riverview station on the route of the interurban line to Charleroi. Estimated cost, $10,250.

Reconstructing tracks on East Ohio Street from Sandusky to Chestnut Streets. Estimated cost, $52,500.

Reconstructing tracks on Allegheny Avenue between Western Avenue and Pennsylvania Avenue. Estimated cost, $24,000.

Reconstructing tracks on Federal Street between Ohio Street and North Avenue. Estimated cost, $22,500.

Reconstructing tracks on Fifth Avenue between Highland and Penn Avenues. Estimated cost, $55,000.

Constructing single line track from Larimer Avenue as extended from the present terminus in Broad Street, to Frankstown Avenue, a distance of 150 ft. Estimated cost, $5,400.

Purchasing land for the construction of a loop at the end of the Lincoln avenue car line. Estimated cost, $17,700.

Reconstructing tracks on the approach of the West Braddock bridge, Rankin. Estimated cost, $5,275.

Altering and changes at the Rankin car house. Estimated cost, $5,000.

Making repairs to stone abutments of the Duquesne viaduct No. 2, between Munhall and Duquesne. Estimated cost, $4,500.

Fire Extinguisher Forces Unite

Announcement has been made of the consolidation of the Foamite Firefoam Company and the O. J. Childs Corporation, Inc. The Foamite Company developed the application of the firefoam method of extinguishing fires. The O. J. Childs Corporation is the developer of chemical and motor fire apparatus. The new corporation will be known as the Foamite-Childs Corporation and will have its executive offices at Utica, N. Y.

Metal, Coal and Material Prices

Metals—New York	Aug. 15, 1922
Copper, electrolytic, cents per lb.	14.00
Copper wire base, cents per lb.	15.625
Lead, cents per lb.	5.775
Zinc, cents per lb.	6.50
Tin, Straits, cents per lb.	32.125
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$10.125
Somerset mine run, Boston, net tons	.....
Pittsburgh mine run, Pittsburgh, net tons	.....
Franklin, Ill., screenings, Chicago, net tons	.....
Central, Ill., screenings, Chicago, net tons	.....
Kansas screenings, Kansas City, net tons	6.00
Materials	
Rubber-covered wire, N. Y., cents per lb.	6.05
Weatherproof wire base, N.Y., cents per lb.	16.00
Cement, Chicago net prices, without bags	$2.05
Linseed oil (5-bbl lots), N.Y., cents per gal.	91.50
White lead, (100-lb. keg), N.Y., cents per lb.	12.50
Turpentine, (bbl. lots), N.Y., per gal.	$1.12

Track and Roadway

Muskegon Traction & Lighting Company, Muskegon, Mich., is spending about $70,000 in improvements, mostly for laying new rails on Western Avenue, for the entire length of the business section.

The Connecticut Company, New Haven, Conn., has started reconstruction of tracks on Burnside Avenue, Hartford, at an estimated cost of $25,000. New rails and ties with concrete base and surface of asphalt will be laid.

Wisconsin Rapids Street Railroad, Wisconsin Rapids, Wis., will extend its line as soon as the paving work makes laying of tracks possible. The Board of Directors recently voted unanimously for the extension.

Southwestern Traction Company, Temple, Tex., will build a 5½ mile extension to Lake Worth. At this point the municipal authorities have appropriated 500 acres of land for an amusement park. The railway cost is estimated at $400,000.

Omaha & Council Bluffs Street Railway, Omaha, Neb., has awarded the contract for double tracking the toll bridge between Omaha and Council Bluffs to the Mount Vernon Bridge Company. About 3,000 tons of new steel and 1,500 tons of remodeled steel will be used. The total cost of the entire reconstruction will be approximately $700,000. The contract specifies that the work should be finished by May 1, 1923.

Signal Equipment

Northwestern Elevated Railroad, Chicago, Ill., has placed an order with the Union Switch & Signal Company for materials involved in the installation of an electro-pneumatic interlocking at Howard Street Terminal. A fifty-one-lever Model 14 electro-pneumatic machine composed of twenty-three working levers for the control of forty-three signals and eight automatic train stops, nineteen levers for the control of eighteen switches and seven double slips, two spare levers and seven spare spaces, is required for the control of this interlocking. Model 14 electro-pneumatic switch and lock movements controlled by Style "C" cutoff valves will be used for the operation of all switches and slips. One and two-arm low-type electro-pneumatic signals as standard on the Northwestern Elevated Railroad will be used throughout. Electro-pneumatic train stops will be installed for the protection of all principal routes. Alternating-current track circuits will provide control for electric switch detector locking, sectional route locking and the control of an illuminated track diagram.

South Side Elevated Railroad of Chicago, Ill., has placed an order with the Union Switch & Signal for materials involved in the installation of an electro-pneumatic interlocking at Jackson Park on the South Side. The installation involves an eleven-lever frame, Model 14 electro-pneumatic machine composed of four working levers for the control of ten signals and three stops, four levers for the control of six switches, and three spare levers. Alternating-current track circuits will be installed for the control of electric detector locking. The switches will be operated by Model 14 electro-pneumatic switch and lock movements, controlled by Style "C" cutoff valves. All principal routes will be protected by electro-pneumatic train stops. The signals will be the electro-pneumatic one and two-arm low-type as standard with this railroad.

Rolling Stock

Chicago (Ill.) Surface Lines will build in its own shops the 69 two-man motor cars and the 45 d.t. one-man cars mentioned in the July 22 issue.

Jamestown, Westfield & Northwestern Railroad, Jamestown, N. Y., is planning on the purchase of several additional electric locomotives and possibly some car equipment.

Guelph (Ont.) Radial Railway announces that the City Council has approved an expenditure of $150,000 for putting its lines in good condition and for providing ten one-man cars.

Buffalo & Lake Erie Traction Company, Erie, Pa., will reconstruct its old type cars for one-man operation. A few months ago the company purchased twenty-five of the new type equipments.

The Toronto Transportation Commission has placed with the Canadian Car & Foundry Company, Ltd., an order for fifty electric cars of the Peter Witt type, together with an order for 100 modern passenger trailers.

Cincinnati (Ohio) Traction Company has ordered seventy-five double-truck cars from the Cincinnati Car Company, in line with the announcement made in these columns July 8. A rumor of proposed purchase of 200 additional cars is unfounded.

San Francisco Municipal Railway will receive bids Sept. 6 through the Board of Public Works for the construction and equipment of an additional twenty new cars. Bids are called for in four groups, covering the bodies, car trucks, motor equipment and air brake equipment.

The City Railways Company, Dayton, Ohio, is operating some double truck one-man cars provided with turnstiles at the rear. The cars were recently built by the Cincinnati Car Company and are operated as front-entrance, pay-enter, rear-exit. Drew mirrors are used on the outside to enable the operator to obtain a view of the rear steps. A signal indicates when doors are properly closed.

Detroit (Mich.) Municipal Railway has placed orders for 200 Peter Witt cars. The McGuire-Cummings Company will build twenty-five steel bodies, the St. Louis Car Company seventy-five, and the Kuhlman Car Company 100. The 100 pairs of trucks for the first two orders will be furnished by the Taylor Electric Truck Company and the remaining 100 pairs are to be furnished by the J. G. Brill Company.

Trade Notes

George S. Bigelow of the Mountain Varnish & Color Works, Toledo, Ohio, has resigned.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., announces that it has recently extended its line of non-automatic and automatic manually operated oil circuit breakers by the addition of breakers of larger capacity, known as type F-22.

National Carbon Company, Inc., Cleveland, Ohio, announces the opening of two finishing plants, one in New York and the other in Chicago, for taking care of emergency requirements of carbon brushes for electric railways. Where quick service is necessary, users should send their orders to the nearest finishing plant.

A. R. McLean, formerly president of the Industrial Protective Company of Dayton, Ohio, and well known for his special work for electric railway companies, has become associated with the Corporation Service Bureau of Cleveland, Ohio, as general manager. D. H. Boyle is president of this concern and L. A. Christiansen vice-president.

G. A. Blackmore, first vice-president of the Union Switch & Signal Company, has had the additional duties of general manager added to his work. Mr. Blackmore entered the service of the company in July, 1896. In July, 1904, he was transferred to the New York office in connection with work on the Interborough Rapid Transit subways and the New York terminal of the Pennsylvania Railroad. In March, 1909, he was appointed assistant Eastern manager, with headquarters in New York, and in April, 1911, was made Eastern manager, in charge of the New York, Montreal and Atlanta offices. He was appointed general sales manager of the company in 1915 with headquarters in Swissvale, Pa., and was elected vice-president in January, 1917.

New Advertising Literature

Ford, Bacon & Davis, Inc., New York, N. Y., has recently issued Pamphlet No. 46 telling about the scope of its service including its engineering, construction and management activities.

The J. G. Brill Company, Philadelphia, Pa., has issued bulletin No. 264 giving instructions for placing Birney safety cars in service. A plan view of a double-end Birney safety car is given with various colorings for the different air lines. Equipment parts are designated by letters.